Public Health Laboratory Service

1974

YEAR BOOK

including Annual Report for 1973

The Report on the work of the Service during 1973 commences on page 43.

WELLCOME
LIBRARY
Ann Rep
WA28
BA1
P97
1974

WELLCOME MUSEUM OF MEDICAL SCIENCE,
183, EUSTON ROAD, LONDON, N.W.1.

II 457

22502911702

CONTENTS

PAGE

THE PUBLIC HEALTH LABORATORY SERVICE BOARD ii

DIRECTOR OF THE PUBLIC HEALTH LABORATORY SERVICE vii

HEADQUARTERS ADMINISTRATIVE OFFICE ix

ORGANISATION AND FUNCTIONS OF THE PUBLIC HEALTH LABORATORY SERVICE

- Introduction 1
- Functions of the Public Health Laboratory Service 1
- Arrangements for Receipt of Specimens 3
- Distribution of Vaccines, etc. 3
- Research 3
- Staffing and Recruitment 4

DIRECTORY OF THE SERVICE

- Distribution of Public Health Laboratories in England and Wales—Map 6
- Headquarters Administrative Office 7
- Central Public Health Laboratory
  - Administration and Central Services 7
  - Reference and Special Laboratories 8
- Other Reference and Special Laboratories 10
- Regional Laboratories 11
- Area Laboratories 13
- Staff on Secondment 20
- Consultants in University and Area Health Authority Laboratories, holding honorary contracts with the PHLS 21
- Reference Experts 25
- Vaccines and Sera obtainable through the Service 35
- Principal Committees 39

REPORT FOR 1973

- Review by the Director of the Service of activities in 1973 43
- List of Publications during 1973 59
- Awards and External Offices accepted by members of the Service during 1973 75
- Grants 76

INDEX TO PERSONAL NAMES 79

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

The Board was established by the Public Health Laboratory Service Act, 1960.

The Chairman and members of the Public Health Laboratory Service Board are appointed by the Secretary of State for Social Services and, in accordance with the Schedule to the Act, the members must include the following (and must therefore be at least eight in number, in addition to the Chairman):

(*a*) not less than two persons appointed after consultation with the Medical Research Council;

(*b*) not less than two persons with experience as microbiologists, appointed after consultation with such organisations as the Secretary of State thinks appropriate;

(*c*) not less than two persons holding office as medical officer of health to a local authority;

(*d*) not less than one person appointed after consultation with such organisations as appear to the Secretary of State to represent the hospital service;

(*e*) not less than one fully registered medical practitioner engaged in general medical practice, appointed after consultation with such organisations as the Secretary of State may recognise as representative of practitioners so engaged.

The Chairman and members of the Board are normally appointed for a term of three years.

Consequential upon the reorganisation of the National Health Service from 1 April 1974, arrangements are being made to amend (*c*).

THE PUBLIC HEALTH LABORATORY SERVICE BOARD

(Including changes up to 1st September 1974)

Chairman: C. E. Gordon Smith, CB, MD, FRCP, FRCPath.
(Dean, London School of Hygiene and Tropical Medicine, London)

Members: F. A. Adams, CB.
(lately Under-Secretary for Finance and Accountant General, Department of Health and Social Security)

H. M. Archibald, MBE, MB, DPH.
(Deputy Chief Medical Officer, Department of Health and Social Security) (*from August 1974*)

R. C. Bryant, CB.
(lately Under-Secretary, Board of Trade)

Professor A. C. Cunliffe, MA, MD, FRCPath.
(Professor of Bacteriology, University of London, at King's College Hospital Medical School, London) (*to July 1974*)

G. D. Duncan, MB, FFCM, DPH.
(Regional Medical Officer, East Anglian Regional Health Authority)

A. J. Essex-Cater, MRCS, FFCM, DCH, DPH, DIH, FRAI.
(lately Medical Officer of Health, Monmouthshire County Council)

Professor D. G. Evans, CBE, DSc, FRS.
(Director, National Institute of Biological Standards and Control, Holly Hill, Hampstead, London) (*to September 1973*)

W. G. Harding, FRCP, FFCM, DPH.
(Area Medical Officer, Camden and Islington, London)

Professor K. McCarthy, MD, FRCPath.
(Professor of Medical Microbiology, University of Liverpool)

Professor D. D. Reid, MD, DSc, FRCP.
(Professor of Medical Statistics and Epidemiology, University of London, at London School of Hygiene and Tropical Medicine) (*from August 1974*)

J. J. A. Reid, TD, BSc, MD, FRCP, FFCM, DPH.
(Deputy Chief Medical Officer, Department of Health and Social Security) (*from August 1973 to July 1974*)

Professor M. H. Richmond, MA, PhD, MRCPath.
(Professor of Bacteriology, University of Bristol) (*from October 1973*)

R. M. Shaw, CB, MB, DPH.
(Deputy Chief Medical Officer, Department of Health and Social Security) (*to July 1973*)

Professor R. A. Shooter, MA, MD, FRCP, FRCPath.
(Professor of Bacteriology, University of London, at St. Bartholomew's Hospital Medical School, London)

C. C. Stevens, OBE, LLB.
(Chairman, Cheshire Area Health Authority)

J. F. Warin, OBE, MA, MD, MRCP, FFCM, DPH.
(lately Medical Officer of Health, Oxford)

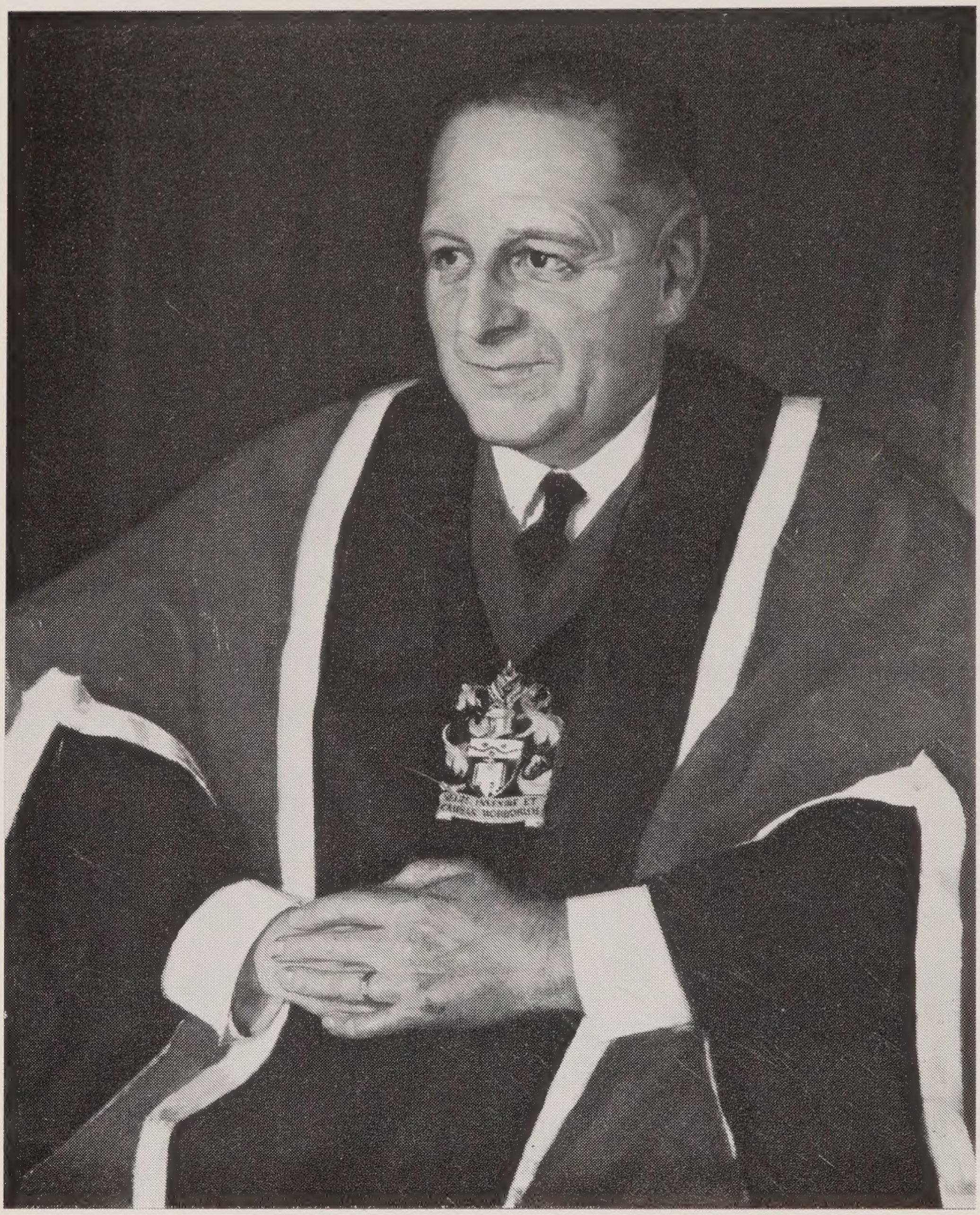
G. I. Watson, OBE, MD, FRCGP, DTM&H.
(Medical Practitioner, Peaslake, Surrey)

Staff Assessors to the Board

B. Moore, MD, BSc, FRCPath.
M. T. Parker, MD, FRCPath, Dip.Bact.

Secretary:

J. D. Whittaker, CBE.



SIR JAMES HOWIE, LLD, MD, FRCP, FRCPath.
Director of the Public Health Laboratory Service 1963-1973

Portrait reproduced by kind permission of
The Royal College of Pathologists

Photograph by J. R. Gibson

DIRECTOR OF THE PUBLIC HEALTH LABORATORY SERVICE

Sir James Howie retired from the Directorship of the Service on 30 September 1973, having held that post for ten years during which there were many changes and great expansion in the work of the laboratories. All members of the Service, and of the PHLS Board will always be grateful to Sir James for his immense efforts on their behalf, efforts that were undiminished by numerous calls on his services in other fields: he was successively President of the Royal College of Pathologists, the British Medical Association, and the Association of Clinical Pathologists.

Professor R. E. O. Williams took up the position of Director of the Service on 1 October 1973. He had been a member of the Service from 1946 until 1960, since when he held the Chair of Bacteriology at St. Mary's Hospital Medical School, London.

HEADQUARTERS ADMINISTRATIVE OFFICE

Lower Entrance, Colindale Hospital,
Colindale Avenue, London NW9 5EQ
Tel.: 01-205 1295

Professor R. E. O. Williams, MD, FRCP, FRCPath, MFCM, MD (Hon) Uppsala. (*Director of the Service*)

J. C. Kelsey, MD, FRCPath, Dip.Bact. (*Deputy Director of the Service: see also p.8*)

J. D. Whittaker, CBE. (*Secretary to the Board*)

R. H. Westlake (*Deputy Secretary to the Board*)

R. Toomey (*Finance Officer*)

B. D. Cunningham (*Establishments Officer*)

R. V. Jackson (*Accountant*)

*A. Waltho (*Officer in Charge*), MRC Central Store, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 0071

---

* Member of the staff of the Medical Research Council.

INTRODUCTION

ORGANISATION AND FUNCTIONS OF THE PUBLIC HEALTH LABORATORY SERVICE

The Public Health Laboratory Service was set up under the National Health Service Acts to provide for the surveillance and control of infective disease in England and Wales. It is administered by a Board (p. iii) which employs the staff under the terms and conditions provided for the National Health Service.

The Public Health Laboratory Service comprises 10 Regional and 48 Area Laboratories distributed through England and Wales (map p. 7), and 15 Reference and Special Laboratories most of which are grouped in the Central Public Health Laboratory at Colindale in North London.

As the laboratory service within the NHS concerned with the monitoring and control of microbial disease, the PHLS participates in " first-line " diagnosis in a number of hospitals and provides " back-up " diagnostic facilities that are available to all hospitals; it collates information on the prevalence of infections and institutes special inquiries into outbreaks of infection and into the epidemiology of infective disease, and it provides routine surveillance of the bacteriological quality of food and water. These functions call for, and provide, excellent opportunities for research both in the laboratory and in the field. The PHLS is thus in a position to advise central and local government, and the hospital service, on many aspects of microbial disease. The PHLS also collaborates with WHO and with national laboratory services overseas in its monitoring and reference work.

FUNCTIONS OF THE PUBLIC HEALTH LABORATORY SERVICE

First line diagnosis

The 10 Regional Laboratories and all but 2 of the 48 Area Laboratories of the PHLS are situated in hospitals; all participate in hospital diagnostic work. The PHLS is thus directly aware of the microbial diseases bringing patients to, or attacking patients already in, hospital and has direct access to a wide range of hospitals in which special investigations can be organised. Since the laboratories mostly provide a diagnostic service for general practitioners, the PHLS also becomes aware of infections occurring outside hospital and has ready access to practices in all parts of the country, and in both urban and rural areas.

Back-up diagnostic facilities

All the Regional and many of the Area PHLS Laboratories carry out special tests for other PHLS and NHS laboratories in their areas. All laboratories are also available to assist hospital laboratories in investigating epidemics.

Further back-up facilities are provided by the Reference Laboratories, which carry out various tests for PHLS and for hospital laboratories throughout the United Kingdom. These tests often require special techniques and facilities which it would be uneconomic to provide in many centres, or which are so infrequently needed that it would be inefficient as well as uneconomic to multiply centres; in the case of other tests it may be considered that concentration provides special advantages for the collection of essential epidemiological information.

The Reference Laboratories not only carry out special laboratory tests, but also provide a great deal of advice to other laboratories and to hospital clinicians and administrators on the control of infection.

Quality Control is a new form of reference activity and the PHLS will shortly be providing for all NHS microbiological laboratories a service which will enable them to control their performance in the isolation of microbes, their identification, and the determination of antibiotic sensitivity. The Standards Laboratory provides an independent check on some of the diagnostic sera and bacterial suspensions available commercially in addition to producing a wide range of reagents itself; the VD Reference Laboratory checks commercial reagents for syphilis serology.

Monitoring the prevalence of infection

The Communicable Disease Report is prepared weekly by the Epidemiological Research Laboratory on the basis of reports received from PHLS and hospital laboratories throughout the British Isles; it provides rapid information on the number of cases of infective diseases diagnosed in these laboratories, and supplements the information available from statutory notification, the RCGP surveillance scheme and other sources of information. It is distributed, in confidence, to collaborating laboratories and designated health officers.

The Epidemiological Research Laboratory, the various Reference Laboratories and *ad hoc* working parties conduct special surveys within their fields to record the prevalence of particular infections. For pathogens more specific identification may add greatly to the epidemiological value of this information. This may be done by the determination of their biotypes (chemical, serological or phage-type), their antibiotic sensitivity or the possession of genetic markers. The Reference Laboratories have special expertise with methods appropriate to the organisms with which they are concerned. The PHLS is also responsible for surveillance of many immunization programmes, and for investigating new immunization methods.

Surveillance of food and drink

All PHLS laboratories provide a bacteriological service to local authorities for the routine examination of water, milk and, increasingly, other foodstuffs, particularly shellfish and imported foods examined at port of entry or centre of distribution. They are often called on to examine foodstuffs in the course of investigating outbreaks of infection and they may be invited to advise manufacturers.

ARRANGEMENTS FOR RECEIPT OF SPECIMENS

The material examined in PHLS laboratories comprises "clinical" specimens (ie throat swabs, blood, faeces, etc.) from persons suspected of suffering from some microbial disease, or of being carriers of some pathogenic microbe, and " sanitary " specimens, such as food and water, submitted either as part of epidemiological investigations or for routine public health surveillance.

Clinical specimens must be submitted by doctors, veterinarians, dentists, or by public health inspectors and others acting on behalf of the appropriate medical officers in local or central health authorities. Clinical specimens cannot be accepted from private persons.

Sanitary specimens can be submitted by the medical officers and the environmental health officers (or their staff) acting on behalf of local authorities. The PHLS is always ready to give advice to food manufacturers and distributors and to carry out limited bacteriological investigations to this end but does not ordinarily undertake routine examinations for commercial organisations.

The Reference and Special Laboratories ordinarily receive specimens only from other laboratories; their facilities are available to all NHS and other official laboratories in the United Kingdom.

DISTRIBUTION OF VACCINES, SERA AND REAGENTS

Some PHLS laboratories (p. 35) hold stocks of rabies vaccine and antiserum, anthrax vaccine, and anti-vaccinia immunoglobulin.

The PHLS Standards Laboratory provides antigens for a number of diagnostic skin tests (p. 35) and also a range of reagents for laboratory diagnostic tests (p. 35). The PHLS Mycological Reference Laboratory can provide some skin test antigens for the diagnosis of fungal disease.

RESEARCH

Most PHLS laboratories are engaged in some research, and many of the larger Regional Laboratories, as well as the Reference Laboratories, have extensive research programmes; some of these are noted in the Director's Report (p. 43). The Service has a number of Committees (p. 39) which organise collaborative research projects and are able to test new ideas and new methods in a variety of circumstances.

The Directors of all the Regional and Area laboratories, and of almost all the Reference and Special laboratories, are medically qualified and have NHS consultant status. Many laboratories have two or more consultants as well as junior medical staff in grades equivalent to those in the hospital service. In an increasing number of laboratories there are additional medical staff employed by Regional Health Authorities, holding honorary contracts with the PHLS. Posts at consultant level are advertised and filled through Advisory Appointments Committees. They are thus open to candidates from outside the Service as well as to PHLS trainees.

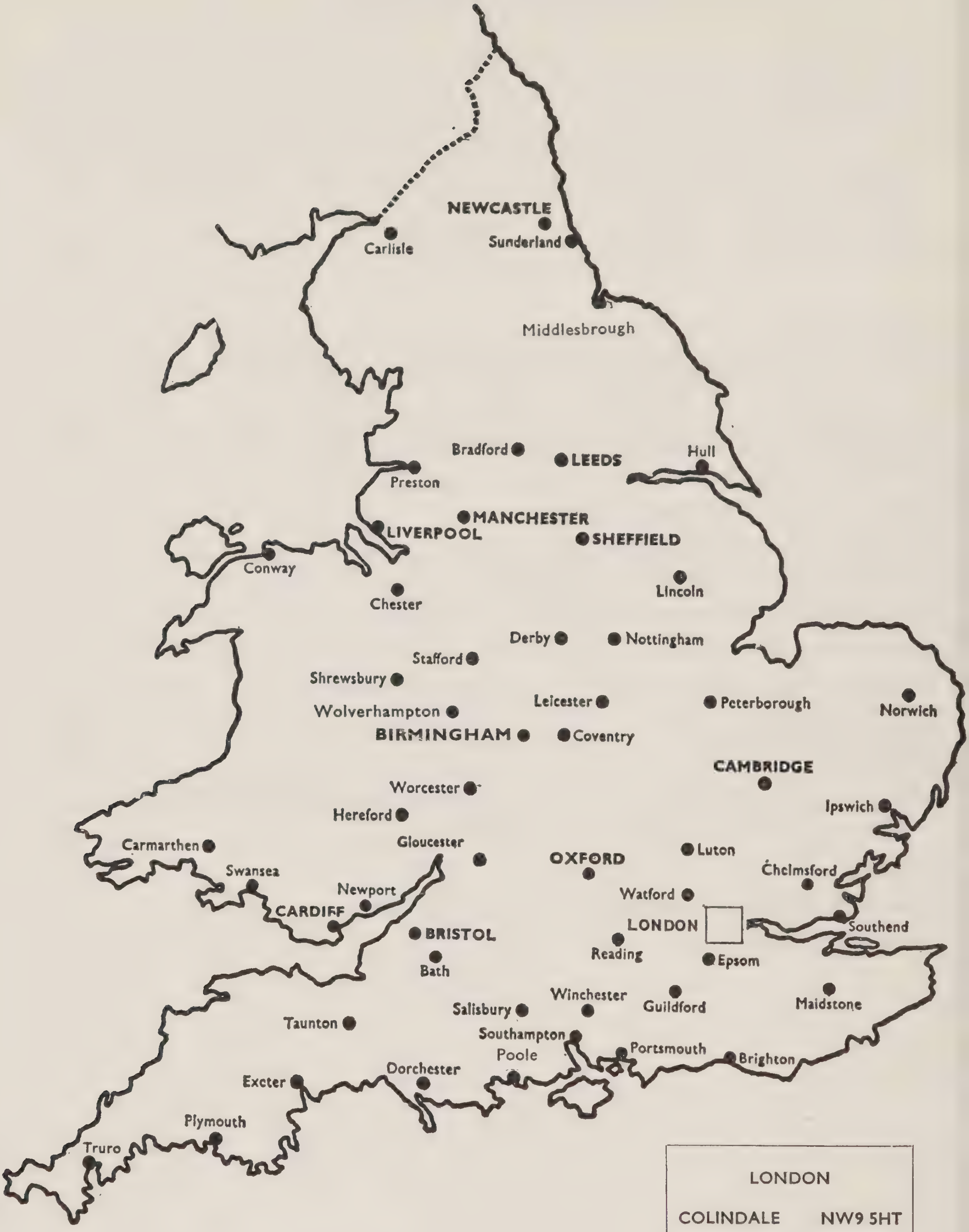
The PHLS provides an integrated training programme for junior medical staff, who are commonly recruited soon after completing pre-registration house appointments; they are given the opportunity of taking the Diploma of Bacteriology Course at London or Manchester, and are provided with good facilities for study towards the membership of the Royal College of Pathologists. All are encouraged to undertake research projects suitable for submission for the MD degree.

An increasing number of PHLS laboratories have posts for science graduates, without a medical qualification, both at post-graduate and post-doctoral level. In many laboratories it is possible for such graduates to conduct part-time research leading to the PhD degree.

The technical staff of the laboratories are generally recruited from school-leavers who have attained the standard of education required for entry to the IMLT or ONC examinations. They are given full opportunities for attending training courses. Senior technical posts are advertised and may be filled by candidates from hospital laboratories or, in a small number of cases, by science graduates.

DIRECTORY OF THE SERVICE

Distribution of Public Health Laboratories in England and Wales—Map .. 6
Headquarters Administrative Office .. 7
Central Public Health Laboratory
  Administration and Central Services .. 7
  Reference and Special Laboratories .. 8
Other Reference and Special Laboratories .. 10
Regional Laboratories .. 11
Area Laboratories .. 13
Staff on Secondment .. 20
Consultants in University and Area Health Authority Laboratories, holding honorary contracts with the PHLS .. 21
Reference Experts .. 25
Vaccines and Sera obtainable through the Service .. 35
Principal Committees .. 39



LONDON	
COLINDALE	NW9 5HT
Central Middlesex Hospital	NW10 7NS
Dulwich	SE22 8QF
Neasden	NW10 8EY
Tooting	SW17 0QT
Whipps Cross	E11 1MR

DIRECTORY OF THE SERVICE

(Staff in post or appointed as at 1 September 1974)

HEADQUARTERS ADMINISTRATIVE OFFICE

Lower Entrance, Colindale Hospital,
Colindale Avenue, London, NW9 5EQ
Tel.: 01-205 1295

Professor R. E. O. Williams, MD, FRCP, FRCPath, MFCM, MD (Hon) Uppsala. (*Director of the Service*)

J. C. Kelsey, MD, FRCPath, Dip.Bact. (*Deputy Director of the Service: see also* p. 8)

J. D. Whittaker, CBE. (*Secretary to the Board*)

R. H. Westlake (*Deputy Secretary to the Board*)

R. Toomey (*Finance Officer*)

B. D. Cunningham (*Establishments Officer*)

R. V. Jackson (*Accountant*)

*A. Waltho (*Officer in Charge*), MRC Central Store, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 0071

CENTRAL PUBLIC HEALTH LABORATORY

Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041
Telegraphic Address: Defender London NW9 5HT

Administration and Central Services

†M. T. Parker, MD, FRCPath, Dip.Bact. (*Administrative Director: see also* p. 8)

†B. E. Andrews, MRCS, FRCPath, Dip.Bact. (*Deputy Administrative Director: see also* p. 9)

H. L. Lloydbottom, AHA. (*Administrator*)

H. Barraclough, FIMLT. (*Media Production Department Manager*)

Mrs. Vivienne M. Taylor, BSc. (*Media Production Department*)

Central Library

Miss Betty H. Whyte, MA, ALA. (*Librarian*)

Mrs. Jane N. Backhouse, BSc. (*Assistant Librarian*)

J. W. Barrington, BA. (*Assistant Librarian*)

---

* Member of the staff of the Medical Research Council.

† These appointments are now held on a rotating basis.

REFERENCE AND SPECIAL LABORATORIES
at the Central Public Health Laboratory.

References:

D	*Director*	M & S	*Other Medical and Scientific Staff*
DD	*Deputy Director*	STO	*Senior Technical Officer*
CC	*Curator*	TO	*Technical Officer*
DC	*Deputy Curator*	HT	*Head Technician*
C	*Consultant*		

COMPUTER TRIALS DEPARTMENT

D	S. P. Lapage, MB, FRCPath, Dip.Bact.
M & S	Mrs. Andrea Evans, BSc
	B. Holmes, MSc.
	W. R. Willcox, BSc.

CROSS-INFECTION REFERENCE LABORATORY

D	M. T. Parker, MD, FRCPath, Dip.Bact.
DD	*O. M. Lidwell, DPhil.
C	R. R. Marples, BM, MSc, MRCPath.
M & S	Mrs. Elizabeth A. Hall Asheshov, PhD, MRCPath, Dip.Bact.
	Miss Judith A. Burnett, BSc.
	M. A. Curtis, BSc.
	*N. Foord, PhD.
	Miss Margaret M. Hardy, BSc.
	E. McKay-Ferguson, MB, MRCS, Dip.Bact.
	W. R. Maxted, Hon.Dr.(Leiden), MIBiol, FIMLT.
	Mrs. Audrey Porterhouse, BSc.
	M. F. Stringer, BSc.
	Mrs. Adeline G. Towers, BSc, MB, MRCPath (*part-time*)
	Mrs. Jean P. Widdowson, BPharm, PhD, MPS.
HT	A. W. Coe

DISINFECTION REFERENCE LABORATORY

D	J. C. Kelsey, MD, FRCPath, Dip.Bact.
M & S	D. Coates, PhD.

ENTERIC REFERENCE LABORATORY

D	Professor E. S. Anderson, MD, FRCPath, FIBiol, Dip.Bact, FRS.
M & S	Mrs. Jacqueline Carr, BSc.
	J. D. H. de Sa, MSc, PhD.
	Mrs. Maureen de Saxe, BSc. (*part-time*)
	Mrs. Jennifer Frost, MSc.
	G. O. Humphreys, PhD.
	Miss Moyra McConnell, BSc.
	Mrs. Marian M. Pullinger, BSc.
	H. R. Smith, BA.
	E. J. Threlfall, PhD.
	Mrs. Linda R. Ward, BSc.
	Mrs. Geraldine Willshaw, PhD.
HT	F. J. Flynn

EPIDEMIOLOGICAL RESEARCH LABORATORY

D	T. M. Pollock, MB, MRCP(Glasg.), FFCM.
DD	J. W. G. Smith, MD, MRCPath, MFCM, Dip.Bact.
C	Mrs. Sheila Polakoff, MA, MD, MFCM, DPH.
M & S	†Mrs. Anne D. E. Clewer, MSc. (*part-time*)
	G. Cust, MB, MFCM, DPH, DTM&H. (*Honorary, part-time*)
	W. B. Fletcher, AMR, FSS.
	Mrs. Betty R. Kirkwood, BA, MSc.
	Miss Christine L. Miller (Mrs. Manning), BM. (*part-time*)
	N. D. Noah, MB, MRCP.
	Miss Mair E. M. Thomas (Mrs. Livingstone), MB, BSc, FRCPath, MFCM, DPH. (*part-time*)
	Mrs. Hilary E. Tillett, MSc.
	Mrs. Enid D. Vernon, BSc.
	Miss Patricia J. Wherry, BSc.

---

* Members of the external scientific staff of the Medical Research Council.

†At London School of Hygiene and Tropical Medicine.

FOOD HYGIENE LABORATORY

D	Miss Betty C. Hobbs, OStJ, DSc, FRCPath, Dip.Bact.
DD	R. J. Gilbert, MPharm, PhD, MRCPath, Dip.Bact, MPS
M & S	Miss Jane Button, BSc.
	A. C. Ghosh, BSc, BVSc&AH, MPhil.
	Miss Diane Roberts, BSc.
	P. C. B. Turnbull, MSc, PhD.
	Miss Antonnette A. Wieneke, Drs. (Holland).
HT	Miss Margaret Kendall, FIMLT.

MYCOPLASMA REFERENCE LABORATORY

D	B. E. Andrews, MRCS, FRCPath, Dip.Bact.
DD	R. H. Leach, MSc, DPhil.
HT	R. A. Hewish, FIMLT

NATIONAL COLLECTION OF TYPE CULTURES

CC	S. P. Lapage, MB, FRCPath, Dip.Bact.
DC	L. R. Hill, MSc, MIBiol.
M & S	I. S. Bowie, MSc, PhD.
	Miss Rita M. Legros, BSc.
	R. J. Owen, BSc, MPhil.
	J. A. Taylor, BSc.
HT	P. J. Fisher

SALMONELLA AND SHIGELLA REFERENCE LABORATORY

D	B. Rowe, MA, MB, DTM&H.
M & S	Mrs. Heather A. Allen, BSc.
	R. J. Gross, MA, MIBiol.
	Miss Margaret Guiney, BSc.
	Mrs. Mary L. M. Hall, BSc.
	Mrs. Sylvia M. Scotland, MSc, PhD.
	Mrs. Christine R. Shipp, BA.
	Mrs. Jane K. Smith, PhD.
HT	D. P. Woodroof, FIMLT.

STANDARDS LABORATORY FOR SEROLOGICAL REAGENTS

D	Mrs. C. M. Patricia Bradstreet, MB, FRCPath, Dip.Bact.
M & S	Mrs. Terese Bloch, BSc.
	Mrs. Mabel W. Dighero, BSc.
	Mrs. Gillian Hutchinson, BSc.
	Mrs. Vaishali A. Kulkarni, MSc.
	Mrs. Agnes J. Macara, BSc.
	Miss Catherine Page, BSc.
	Mrs. E. Margaret Supran, BSc.
HT	J. Foreman, FIMLT.

VIRUS REFERENCE LABORATORY

D	Mrs. Marguerite S. Pereira, MD.
C	Miss Yvonne E. Cossart (Mrs. Wills), MB, BSc, MRCPath, DCP.
	Mrs. Joan M. B. Edwards, MB, MRCPath. (*part-time*)
	P. G. Higgins, MD, MRCPath, Dip.Bact.
M & S	Mrs. Hazel Appleton, BSc.
	Mrs. Pratima Chakraverty, BSc, MPhil.
	B. J. Cohen, BSc.
	Miss Anne M. Field, PhD.
	Miss Sylvia D. Gardner (Mrs. Kingsbury), MB, MRCPath, Dip. Bact.
	Mrs. Patricia E. Gibson, MSc.
	Miss Wendy A. Knowles, BSc.
	P. P. Mortimer, MB, Dip.Bact.
	F. G. Rodgers, BSc.
	Mrs. Mary O. Roebuck, MB, Dip.Bact. (*part-time*)
	Mrs. Elise M. Vandervelde, MB, Dip.Bact.
TO	J. R. McDonald, FIMLT.

BACTERIAL METABOLISM RESEARCH LABORATORY

Colindale Hospital, Colindale Avenue,
London, NW9 5DX
Tel.: 01-205 6144/5

D	Professor R. E. O. Williams, MD, FRCP, FRCPath, MFCM, MD (Hon) Uppsala.
DD	M. J. Hill, PhD, ARIC.
M & S	Miss Hillary J. Barnett, PhD.
	Miss Elizabeth S. Bone, BSc.
	B. S. Drasar, PhD.
	Miss Susan L. Peach, BSc.
HT	Mrs. Sandra P. Heaton, FIMLT.

LEPTOSPIROSIS REFERENCE LABORATORY

Colindale Hospital, Colindale Avenue,
London, NW9 5DX
Tel.: 01-205 6144/5

D	L. H. Turner, MBE, MD, DTM&H
DD	Mrs. Joyce D. Coghlan, PhD.
HT	G. McGimpsey, FIMLT.

MYCOLOGICAL REFERENCE LABORATORY

London School of Hygiene and
Tropical Medicine, Keppel Street,
London, WC1E 7HT
Tel.: 01-636 8636

D	D. W. R. Mackenzie, PhD.
M & S	M. R. Hollingdale, PhD.
	Miss Christine M. Philpot, BSc.
HT	A. G. J. Proctor, TD, BD, FIMLT.

MICROBIOLOGY QUALITY CONTROL LABORATORY

Neasden Hospital, Brentfield Road,
London, NW10 8EY
Tel.: 01-459 1422

D	P. B. Crone, MD, Dip.Bact.
M & S	D. F. J. Brown, BSc.
HT	

TUBERCULOSIS REFERENCE LABORATORY

University Hospital of Wales, Heath
Park, Cardiff, CF4 4XW
Tel.: Cardiff (STD 0222) 755944
Ext. 2049

D	J. Marks, MD, FRCP, FRCPath, Dip.Bact.
M & S	P. A. Jenkins, PhD.
	D. H. M. Joynson, MB, MRCP, Dip.Bact.
	J. L. Leat, BSc.
	M. D. Yates, BSc.
HT	L. R. Duddridge, FIMLT.

VENEREAL DISEASES REFERENCE LABORATORY

London Hospital Research Laboratories, Ashfield Street, London,
E1 2BL
Tel.: 01-790 3008

D	A. E. Wilkinson, MB, FRCPath, MRCS.
C	Miss Nafra A. Johnston (Mrs. Tarlton), MD, BAO, DRCOG.
M & S	Miss Barbara D. Kolator, BSc.
	A. D. Seth, MSc.
HT	G. W. Lavender, FIMLT.

REGIONAL LABORATORIES

BIRMINGHAM

Public Health Laboratory, East
Birmingham Hospital, Bordesley
Green East, Birmingham, B9 5ST
Tel.: 021-772 4311, *Ext.* 680

D	J. G. P. Hutchison, MD, FRCP (Glasg.), FRCPath.
DD	*F. A. J. Bridgwater, MB, MRCPath, Dip.Bact.
M & S	D. McGhie, MB, Dip.Bact.
	M. J. Robertson, MRCS, DTM&H, Dip.Bact.
	G. Tebbutt, BSc.
HT	P. D. Littlejohns, FIMLT.

BRISTOL

Public Health Laboratory, Myrtle
Road, Kingsdown, Bristol, BS2 8EL
Tel.: Bristol (STD 0272) 291326

D	H. R. Cayton, MB, FRCPath.
DD	Miss Suzanne K. R. Clarke, MD, FRCPath.
M & S	W. K. Paver, BSc.
	Mrs. Shirley R. Richmond, BA, MB. (*part-time*)
HT	R. Shannon, MPhil, FIMLT.

CAMBRIDGE

Public Health Laboratory, Hills Road,
Cambridge, CB2 2QW
Tel.: Cambridge (STD 0223) 42111

D	G. R. E. Naylor, MD, FRCP.
DD	Miss Joan M. Boissard, MRCS.
C	J. Nagington, MD, Dip.Bact.
HT	V. C. T. Rolfe, FIMLT.

CARDIFF

Public Health Laboratory, University
Hospital of Wales, Heath Park,
Cardiff, CF4 4XW
Tel.: Cardiff (STD 0222) 755944

D	C. H. L. Howells, BSc, MD, FRCPath.
DD	R. W. S. Harvey, BSc, MD, FRCPath, Dip.Bact.
C	A. D. Evans, MB, BSc, FRCPath, Dip.Bact.
M & S	Miss Julia A. Munro (Mrs. Price), MB, MRCS.
HT	T. H. Price, FIMLT.

LEEDS

Public Health Laboratory, Bridle
Path, York Road, Leeds LS15 7TR
Tel.: Leeds (STD 0532) 645011

D	G. L. Gibson, MD, FRCPath.
DD	M. H. Hambling, MD, MRCPath, DORCOG, Dip.Bact.
C	L. A. Little, MB, FRCPath, Dip.Bact.
	G. B. Ludlam, MD, FRCPath, DTM&H, DLO.
M & S	Miss Susan Henderson, BSc.
	K. A. Karim, BSc.
	J. A. Pinegar, MSc.
HT	W. R. Ivory-Hollingdale, FIMLT.

---

* Consultant Microbiologist employed by the West Midlands Regional Health Authority.

LIVERPOOL

Public Health Laboratory, Fazakerley Hospital, Lower Lane Liverpool, L9 7AL
Tel.: 051-525 2323

D	G. C. Turner, MD, FRCPath.
DD	Miss Elizabeth C. Armstrong, MD, MRCPath, Dip.Bact.
C	G. B. B. White, MRCS, MRCPath, Dip.Bact.
M & S	C. I. Ashton, BSc. Miss Margery B. Baillie, MSc, PhD. Mrs. Helen T. Green, MD. (*part-time*) H. Mallinson, PhD. Miss Stella M. Parrack (Mrs. Goldberg), MB, DRCOG. (*part-time*) C. Roberts, BSc, MD, MRCPath, Dp.Bact. Mrs. Dawn Stancliffe, BSc.
HT	R. Harper, FIMLT.

MANCHESTER

Public Health Laboratory, Withington Hospital, Manchester, M20 8LR
Tel.: 061-445 2416

D	D. M. Jones, MD, MRCPath, Dip.Bact. (from February 1975)
DD	J. D. Abbott, MD, FRCPath, Dip.Bact.
M & S	J. E. Cradock-Watson, BM. A. Curry, BSc. Miss Judith M. Hellawell, BSc. Miss Margaret E. Macaulay, MB, Dp.Bact. Mrs. Helen McDonald, MB. (*part-time*) Miss Angela H. Pykett, MB, Dp.Bact. Miss Joan M. Watkinson, BSc. Mrs. Kathleen Whale, MB.
HT	L. E. Simmons, FIMLT.

NEWCASTLE

Public Health Laboratory, Institute of Pathology, General Hospital,
Westgate Road,
Newcastle upon Tyne, NE4 6BE
Tel.: Newcastle (STD 0632) 38811, *Ext.* 297

D	J. H. Hale, OBE, MD, FRCP, FRCPath.
DD	*J. B. Selkon, MB, MRCPath, DCP.
C	A. A. Codd, MD, Dip.Bact. *H. R. Ingham, MB, MRCPath, Dip.Bact.
M & S	G. E. Rich, MB, MRCPath, Dip.Bact.
HT	J. A. Hall, FIMLT.

OXFORD

Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH
Tel.: Oxford (STD 0865) 49231/2

D	J. O'H. Tobin, BM, FRCPath, MRCP, Dip.Bact. (from February 1975)
DD	H. H. Johnston, MA, DPhil.
M & S	R. T. Mayon-White, MB, MRCP. J. Sellers, MB, BSc, MRCPath. Mrs. Barbara M. Tobin, PhD, Dp.Bact. (*part-time*) A. H. Tomlinson, MA, DPhil, FRCPath.
HT	A. Peacock.

SHEFFIELD

Public Health Laboratory, Northern General Hospital, Herries Road,
Sheffield, S5 7AU
Tel.: Sheffield (STD 0742) 387253

D	E. H. Gillespie, MB, FRCPath.
DD	Miss Margaret A. M. Wilson, MB, FRCPath, Dip.Bact.
C	A. E. Jephcott, MA, MB, MRCPath, Dip.Bact.
M & S	J. Gray, MB, MRCS. D. B. McGechie, MB, MRCS, Dip.Bact.
HT	W. A. Sutcliffe, FIMLT.

---

* Consultant Microbiologists employed by the Northern Regional Health Authority.

BATH

Public Health Laboratory, Royal United Hospital, Combe Park, Bath, BA1 3NG
Tel.: Bath (STD 0225) 24624

D	P. G. Mann, MD, MRCPath, Dip.Bact.
M & S	Miss Monica Zealley (Mrs. Mann), MB.
HT	D. W. Marshall, FIMLT.

BRIGHTON

Public Health Laboratory, Royal Sussex County Hospital, Brighton, BN2 5BE
Tel.: Brighton (STD 0273) 63506

D	B. T. Thom, MB, MRCPath, Dip.Bact.
HT	G. H. Burrell, AMILT.

CARLISLE

Public Health Laboratory, Cumberland Infirmary, Carlisle
Tel.: Carlisle (STD 0228) 23654 or 23444

D	D. G. Davies, MD, FRCPath, Dip.Bact.
HT	A. R. Wood, FIMLT.

CARMARTHEN

Public Health Laboratory, West Wales General Hospital, Glangwili, Carmarthen
Tel.: Carmarthen (STD 0267) 7271

D	H. D. S. Morgan, MRCS, FRCPath, Dip.Bact.
HT	G. Davies, AIMLT.

CHELMSFORD

Public Health Laboratory, Chelmsford and Essex Hospital, New London Road, Chelmsford
Tel.: Chelmsford (STD 0245) 65827

D	R. Pilsworth, MD, Dip.Bact.
DD	J. A, Rycroft, MA, MB, FRCPath, Dip.Bact.
HT	P. Maybury, FIMLT.

CHESTER

Public Health Laboratory, Chester City Hospital, Hoole Lane, Chester, CH2 3EG
Tel.: Chester (STD 0244) 21417

D	Miss Pauline M. Poole, MD, FRCPath, BAO, Dip.Bact.
DD	*J. H. Pennington, MD, MRCPath.
HT	D. Breckon, FIMLT.

CONWAY

Public Health Laboratory, " Bryn Hyfryd ", Conway, LL32 8PG
Tel.: Conway (STD 0492-63) 2478

D	A. J. Kingsley Smith, BM, MRCPath.
C	†F. B. Jackson, MB, FRCPath.
HT	K. L. Thomas, FIMLT.

COVENTRY

Public Health Laboratory, Coventry and Warwickshire Hospital, Stoney Stanton Road, Coventry, CV1 4FH
Tel.: Coventry (STD 0203) 24055

D	J. E. M. Whitehead, MA, MB, FRCPath, Dip.Bact.
C	‡Mrs. Evelyn M. Finnie, MD, MSc.
HT	M. W. Scruton, FIMLT.

---

* Consultant Microbiologist employed by the Mersey Regional Health Authority.

† In charge of the Sub-Laboratory at the Royal Alexandra Hospital, Rhyl.

‡ Consultant Microbiologist employed on behalf of the West Midlands Regional Health Authority.

DERBY
Public Health Laboratory, 121a, Osmaston Road, Derby DE1 2GB
Tel.: Derby (STD 0332) 41513

D B. W. Barton, MB, MRCPath, Dip.Bact.
HT G. R. Cowburn, FIMLT.

DORCHESTER
Public Health Laboratory, Glyde Path Road, Dorchester, Dorset
Tel.: Dorchester (STD 0305) 4478

D G. H. Tee, MRCS, FRCPath, PhD.
HT E. F. C. Coetzee, FIMLT.

EPSOM
Public Health Laboratory, West Park Hospital, Epsom
Tel.: Epsom 01-78 26633

D D. R. Gamble, MB, FRCPath, Dip.Bact.
DD Miss Elizabeth I. Tanner, MB, MRCPath, Dip.Bact.
M & S T. J. Coleman, MB.
HT C. H. Bullin, FIMLT.

EXETER
Public Health Laboratory, Church Lane, Heavitree, Exeter, EX2 5AD
Tel.: Exeter (STD 0392) 77833

D B. Moore, MD, BSc, FRCPath.
DD R. J. C. Hart, MB, MRCS, FRCPath, Dip.Bact.
M & S J. B. Kurtz, MA, MB, MRCP.
W. J. Ryan, MB, DPH, Dip.Bact.
Mrs. Elizabeth McC. White, MD, DPH, DCH.
HT D. T. Lansdowne, FIMLT.

GLOUCESTER
Public Health Laboratory, Gloucestershire Royal Hospital, Southgate Street, Gloucester, GL1 1UD
Tel.: Gloucester (STD 0452) 21021

D A. E. Wright, TD, MD, FRCPath, DPH, Dip.Bact.
C *A. C. P. H. Roome, MB, MRCPath.
HT G. Spence, FIMLT.

GUILDFORD
Public Health Laboratory, St. Luke's Hospital, Guildford, GU1 3NT
Tel.: Guildford, (STD 0483) 66091

D Miss Joan R. Davies, MD, Dip.Bact.
DD R. Y. Cartwright, MB, MRCPath.
C †C. E. Watson, BSc, MB, FRCPath.
M & S Mrs. E. Valerie Meurisse, MSc.
Miss Sheila Payne, BSc.
HT A. J. Smith, FIMLT.

HEREFORD
Public Health Laboratory, County Hospital, Hereford, HR1 2ER
Tel.: Hereford (STD 0423) 4696

D D. R. Christie, MB, Dip.Bact.
HT G. W. Taylor, FIMLT.

HULL
Public Health Laboratory, Hull Royal Infirmary, Anlaby Road, Hull, HU3 2JZ
Tel.: Hull (STD 0482) 23046

D J. H. McCoy, MB, DPH.
HT G. E. Spain, FIMLT.

---

* Consultant Microbiologist employed by the South Western Regional Health Authority.

† Consultant Microbiologist employed on behalf of the South West Thames Regional Health Authority: main duties at District Laboratory, Frimley Park Hospital.

IPSWICH

Public Health Laboratory, Woodbridge Road East, Ipswich, IP4 5PE
Tel.: Ipswich (STD 0473) 77261/2

D	P. K. Fraser, MD, FRCP, FRCPath.
HT	G. K. Bailey, FIMLT.

LEICESTER

Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9QE
Tel.: Leicester (STD 0533) 872283

D	N. S. Mair, MB, FRCPath, DCH, DPH, Dip.Bact.
DD	Mrs. Hélène J. Mair, MD, MRCPath, Dip.Bact.
HT	E. Fox, FIMLT.

LINCOLN

Public Health Laboratory, St. Anne's Road, Lincoln, LN2 5RF
Tel.: Lincoln (STD 0522) 28607

D	J. G. Wallace, BM, MRCPath, DCP, Dip.Bact.
HT	R. Clark, FIMLT.

LONDON

CENTRAL MIDDLESEX HOSPITAL

Public Health Laboratory, Central Middlesex Hospital, Acton Lane, Park Royal, London, NW10 7NS
Tel.: 01-965 9505/6

D	C. E. D. Taylor, MA, MD, FRC Path, Dip.Bact.
DD	*D. A. McSwiggan, LRCPI, MRCPath, DTM&H. Dip.Bact.
M & S	H. G. S. Murray, MD.
	A. A. G. Saeed, MB, DAP&E, PhD.
TO	G. V. Heimer, FIMLT.
HT	D. F. Halliday, FIMLT.

LONDON (*continued*)

DULWICH

Public Health Laboratory, Dulwich Hospital, East Dulwich Grove, London, SE22 8QF
Tel.: 01-693 3377

D	C. Dulake, MB, MRCPath, Dip.Bact.
M & S	Miss Elizabeth Price, MB, MRCS, DCH
STO	C. H. Collins, MBE, MIBiol, FIMLT.
HT	W. N. Farrant, FIMLT.

TOOTING

Public Health Laboratory, St. George's Hospital, Blackshaw Road, London, SW17 0QT
Tel.: 01-672 1255

D	D. G. Fleck, MD, FRCPath, Dip.Bact.
M & S	D. V. Seal, MB, MRCS.
	Miss Janet E. M. Strangeways, MB, MRCS, MRCPath.
HT	B. S. Chessum, FIMLT.

WHIPPS CROSS

Public Health Laboratory, Whipps Cross Hospital, Whipps Cross Road, London, E11 1NR
Tel.: 01-539 5223

D	B. Chattopadhyay, MB, MRCPath, DCP.
HT	J. N. Pilfold, FIMLT.

---

* Consultant Microbiologist employed by the North West Thames Regional Health Authority.

LUTON

Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton, LU4 0DZ
Tel.: Luton (STD 0582) 52007

D	A. T. Willis, MD, PhD, DSc, FRCPA, MRACP, MRCPath.
M & S	Mrs. Catherine L. Bullen, MRCVS. (*part-time*) I. R. Ferguson, MB, MRCS, Dip.Bact. P. H. Jones, MB. K. D. Phillips, BSc.
HT	R. Burt, FIMLT.

MAIDSTONE

Public Health Laboratory, Preston Hall, Maidstone, ME20 7NH
Tel.: Maidstone (STD 0622) 77155.

D	A. L. Furniss, MD, Dip.Bact.
DD	Miss Ruth C. J. James (Mrs. Barkhan), MB, MRCPath, Dip.Bact. (*part-time*)
C	*Miss Helen G. Ross (Mrs. Jealous), MB, MRCPath, DTM&H, Dip.Bact.
M & S	J. V. Lee, PhD.
HT	T. J. Donovan, FIMLT.

MIDDLESBROUGH
(formerly TEESSIDE)

Public Health Laboratory, General Hospital, Ayresome Green Lane, Middlesbrough, Cleveland, TS5 5AZ
Tel.: Middlesbrough (STD 0642) 87766

D	P. R. Mortimer, MB, MRCPath.
M & S	L. M. de Silva, MB, Dp.Bact.
HT	W. H. Bound, FIMLT.

NEWPORT

Public Health Laboratory, Clytha Square, Newport, Gwent, NPT 2TZ
Tel.: Newport (STD 0633) 63248

D	R. D. Gray, MD, FRCPath, DPH.
TO	G. H. Lowe, FIMLT (holder of collection of type cultures of *Trichomonads*)
HT	D. Banner, FIMLT.

NORWICH

Public Health Laboratory, Bowthorpe Road, Norwich, NOR 22H
Tel.: Norwich (STD 0603) 28145

D	W. Shepherd, MD, FRCPath.
C	†C. G. A. Thomas, MA, BM, MRCP, FRCPath.
M & S	Mrs. Gwendoline L. Gilbert, MB, MRACP. (*part-time*) Miss Margaret Fitt, BSc.
HT	C. W. Sivell, FIMLT.

NOTTINGHAM

Public Health Laboratory, City and Sherwood Hospitals, Hucknall Road, Nottingham, NG5 1PH
Tel.: Nottingham (STD 0602) 605065

D	E. R. Mitchell, MB, MRCPath, Dip.Bact.
C	‡Miss Purvin Ispahani, MB, MRCPath, Dip.Bact, DCP. §M. J. Lewis, MD, Dip.Bact. ‡A. D. Macrae, MD, FRCPath, Dip.Bact.
M & S	S. L. Mawer, MB.
HT	P. A. Greaves, FIMLT.

---

* Consultant Microbiologist employed on behalf of the South East Thames Regional Health Authority: main duties at All Saints Hospital, Chatham.

† Consultant Microbiologist employed on behalf of the East Anglian Regional Health Authority.

‡ Consultant Microbiologists employed on behalf of the Nottinghamshire Area Health Authority (Teaching).

§ Seconded to Department of Medical Microbiology, Medical School, University of Nottingham.

PETERBOROUGH

Public Health Laboratory, St. John's Hospital, Thorpe Road, Peterborough, PE3 6JW
Tel.: Peterborough (STD 0733) 67451, *Ext.* 657

D	E. J. G. Glencross, MB, FRCPath, Dip.Bact.
HT	M. W. D. Buxton, FIMLT.

PLYMOUTH

Public Health Laboratory, Plymouth General Hospital, Greenbank Road, Plymouth, PL4 8NN
Tel.: Plymouth (STD 0752) 63997

D	P. D. Meers, MD, FRCPath, Dip.Bact.
DD	*Miss Gillian M. Churcher, MB, MRCPath, Dip.Bact.
M & S	M. W. Calder, MB. (*part-time*) J. H. Hewitt, BSc.
HT	G. H. Sandys, FIMLT.

POOLE

Public Health Laboratory, Poole General Hospital, Poole, Dorset, BH15 2JB
Tel.: Poole (STD 02013) 5771

D	W. L. Hooper, BSc, MB, MRCPath, Dip.Bact.
DD	†J. Craske, BA, MB, MRCPath, Dip.Bact.
HT	M. S. Jones, FIMLT.

PORTSMOUTH

Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ
Tel.: Portsmouth (STD 0705) 22331

D	D. J. H. Payne, MB, FRCPath, MRCP, Dip.Bact.
DD	J. V. T. Gostling, MA, MB, MRCS, FRCPath.
C	†O. A. Okubadejo, MD, MRCPath, DCP.
M & S	Mrs. Rosalind Maskell, MA, BM, DORCOG. (*part-time*) §A. D. Pearson, BA, BM, Dip.Bact.
HT	R. A. Quaife, FIMLT.

PRESTON

Public Health Laboratory, Royal Infirmary, Meadow Street, Preston, PR1 6PS
Tel.: Preston (STD 0772) 53975

D	L. Robertson, MA, BM, FRCPath.
DD	‡D. N. Hutchinson, MD, Dip.Bact.
HT	H. C. Dawkins, FIMLT.

READING

Public Health Laboratory, Royal Berkshire Hospital, Reading, RG1 5AN
Tel.: Reading (STD 0734) 52957

D	J. V. Dadswell, MB, MRCPath.
HT	R. C. Masters, FIMLT.

---

* Consultant Microbiologist employed by the South Western Regional Health Authority.
† Consultant Microbiologists employed on behalf of the Wessex Regional Health Authority.
‡ Consultant Microbiologist employed by the North Western Regional Health Authority.
§ Holds the Astor Research Fellowship of the Royal College of Pathologists.

SALISBURY

Public Health Laboratory, Odstock Hospital, Salisbury, SP2 8BJ
Tel.: Salisbury (STD 0722) 6020

D P. J. Wormald, MD, FRCPath.
HT A. S. Greasby, FIMLT.

SHREWSBURY

Public Health Laboratory, Salop Infirmary Group Laboratories, Mytton Oak Road, Shrewsbury
Tel.: Shrewsbury (STD 0743) 57101

D C. A. Morris, BSc, MD, Dip.Bact.
DD *N. J. Mitchell, MB, MRCS, MRCPath, Dip.Bact.
TO P. H. Everall, FIMLT.
HT D. A. Porter, FIMLT.

SOUTHAMPTON

Public Health Laboratory, General Hospital, Tremona Road,
Southampton, SO9 4XY
Tel.: Southampton (STD 0703) 776177

D J. M. Graham, MB, FRCPath, Dip.Bact.
C †A. M. R. Mackenzie, BA, BSc, BM, MRCPath, Dip.Bact.
HT W. G. Suckling, AIMLT.

STAFFORD

Public Health Laboratory, Martin Street, Stafford
Tel.: Stafford (STD 0785) 54377

From Spring 1975
Public Health Laboratory, Central Pathology Laboratory, Hartshill Road, Hartshill, Stoke-on-Trent.
Tel.: Stoke-on-Trent (STD 0782)

D P. Cavanagh, MA, MD, BAO, Dip.Bact.
HT L. J. Haughton, FIMLT.

‡SUNDERLAND

Public Health Laboratory, Havelock Hospital, Hylton Road, Sunderland SR4 8AE
Tel.: Sunderland (STD 0783) 58256

D G. Scrimgeour, MB, MRCPath, Dip.Bact.
HT J. B. Patton, FIMLT..

SWANSEA

Public Health Laboratory, Cockett Road, Swansea, SA2 0FA
Tel.: Swansea (STD 0792) 24041

D W. Kwantes, MA, MB, FRCPath, Dip.Bact.
M & S Mrs. Barbara R. Ivey, MB. (*part-time*)
HT R. Brooks, FIMLT.

---

* Consultant Microbiologist employed on behalf of the West Midlands Regional Health Authority.

† Consultant Microbiologist employed on behalf of the Wessex Regional Health Authority.

‡Administered by the Public Health Laboratory Service Board on behalf of the Northern Regional Health Authority.

TAUNTON

Public Health Laboratory, Taunton and Somerset Hospital, Musgrove Park Branch, Taunton, TA1 5DB
Tel.: Taunton (STD 0823) 85557/8

D	J. V. S.Pether, MA, BM, MRCPath, DTM & H, Dip.Bact.
M & S	Mrs. Patricia M. Benn, MB. (*part-time*) Miss Phillippa H. Trevains, BSc.
HT	F. B. Greatorex, FIMLT.

TEESSIDE

Under Local Government reorganisation Teesside no longer exists. The Laboratory has reverted to being listed under MIDDLESBROUGH.

TRURO

Public Health Laboratory, Royal Cornwall Hospital (City), Infirmary Hill, Truro, TR1 2HZ
Tel.: Truro (STD 0872) 3029

D	G. I. Barrow, MD, FRCPath, Dip.Bact.
M & S	J. C. K. Mills, MA, MB, Dip.Bact.
HT	C. Ellis, FIMLT.

WATFORD

Public Health Laboratory, Shrodells Wing, Watford General Hospital, Vicarage Road, Watford, WD1 8HB
Tel.: Watford 01-91 44366

D	B. R. Eaton, MB, MRCPath, DCH.
HT	Miss Hilda Taylor, FIMLT.

WINCHESTER

Public Health Laboratory, Royal Hampshire County Hospital, Winchester, SO22 5DG
Tel.: Winchester (STD 0962) 3807

D	M. H. Hughes, MA, DM, FRCPath, DTM & H, Dip.Bact. (*part-time*)
HT	D. I. Bartlett, FIMLT.

WOLVERHAMPTON

Public Health Laboratory, New Cross Hospital, Wolverhampton, WV10 0QP
Tel.: Wolverhampton (STD 0902) 734311

D	*I. A. Harper, MB, MRCPath.
M & S	R. G. Thompson, MRCS, MRCPath.
HT	J. Leek, FIMLT.

WORCESTER

Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester, WR1 3AS
Tel.: Worcester (STD 0905) 25238/9

D	R. J. Henderson, MD.
M & S	M. B. Skirrow, MB, PhD, MRCPath, DTM & H.
HT	H. R. Jenkins, FIMLT.

---

* Honorary Consultant Microbiologist Director employed by the West Midlands Regional Health Authority.

Staff on Secondment

K. T. Crane, FIMLT. (*to the Medical Research Council Laboratories, Fajara, The Gambia*)

R. Darnell, MB, Dip.Bact. (*to the London School of Hygiene and Tropical Medicine*)

Miss Susan E. J. Young, BA, MB, MRCP, BAO, DCH, Dip.Bact. (*to the North West Thames Regional Health Authority*)

Consultant Microbiologists in University and Area Health Authority Laboratories holding honorary contracts with the Public Health Laboratory Service Board

(This list omits consultants working in Public Health Laboratory Service laboratories and included in the Directory, pp. 8–19)

J. F. ARCHER, MD, MRCPath, Dip.Bact.
Bury General Hospital, Walmersley Road, Bury, Lancashire.
Tel. 061-764 2444.

R. BLOWERS, MD, FRCP, FRCPath, Dip.Bact.
Division of Hospital Infection, Clinical Research Centre, Watford Road, Harrow, Middlesex, HA1 3UJ.
Tel. 01-864 5311.

T. D. BROGAN, MD, PhD.
Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel. Cardiff (STD 0222) 755944.

W. M. EDGAR, MA, MD, FRCPath.
Department of Pathology, Royal Infirmary, Bradford, BD9 6RJ.
Tel. Bradford (STD 0274) 42200, *Ext.* 321.

T. H. FLEWETT, MD, FRCPath.
Regional Virus Laboratory, East Birmingham Hospital, Bordesley Green East, Birmingham, B9 5ST.
Tel. 021-772 4021.

M. H. GLEESON-WHITE, MA, MB, BSc, MRCS, FRCPath.
The John Bonnett Clinical Laboratories, Addenbrooke's Hospital, Cambridge, CB2 1QH.

L. J. H. E. HAYEK, MB, MRCPath, DObstRCOG.
Department of Pathology, Torbay Hospital, Newton Road, Torquay, TQ2 7AA.
Tel. Torquay (STD 0803) 64567.

C. S. HEYMANN, MB, MRCPath, DPH, DTM&H, Dip.Bact.
Queen Mary's Hospital for Children, Carshalton.
Tel. 01-643 3300.

Miss M. PATRICIA JEVONS, MD, FRCPath, Dip.Bact.
Group Pathology Laboratories, St. Stephen's Hospital, Chelsea, London, S.W.10.
Tel. 01-352 8161.

C. R. KNAPPETT, MD, MRCPath, Dip.Bact.
Department of Microbiology, City General Hospital, Stoke-on-Trent, ST4 6QC.
Tel. Newcastle (STD 0782) 616273.

H. S. LAWY, MD, FRCPath, LMSSA, Dp.Bact.
Department of Pathology, Grimsby General Hospital, Grimsby, Lincolnshire.
Tel. Grimsby (STD 0472) 59051.

M. LONGSON, BSc, MD.
Department of Virology, Withington Hospital, Manchester, M20 8LR.
Tel. 061-445 8111.

T. D. M. MARTIN, MRCS, FRCPath.
Department of Pathology, Royal Berkshire Hospital, Reading, Berkshire.
Tel. Reading (STD 0734) 83444.

J. M. MOORE, MD, MRCPath.
Bacteriology Laboratory, Doncaster Royal Infirmary, Doncaster, Yorkshire.
Tel. Doncaster (STD 0302) 66666.

S. W. B. NEWSOM, MA, MB, MRCPath, DTM&H.
Simms Woodhead Memorial Laboratory, Papworth Hospital, Papworth Everard, Cambridge.
Tel. Papworth St. Agnes (STD 048 088) 371, *Ext.* 233.

M. W. B. NICHOLLS, MB, MRCS, MRCPath.
Department of Pathology, St. Richard's Hospital, Chichester.
Tel. Chichester (STD 0243) 82671.

Professor F. W. O'GRADY, TD, MSc, FRCPath.
The Medical School, University Park, Nottingham, NG7 2RD.
Tel. Nottingham (STD 0602) 56101.

N. W. PRESTON, MD, FRCPath, Dp.Bact.
Department of Bacteriology and Virology, University of Manchester, Williamson Building, Brunswick Street, Manchester, M13 9PL.
Tel. 061-273 3333.

D. S. REEVES, MB, MRCS, MRCPath.
Department of Microbiology, Southmead Hospital, Westbury-on-Trym, Bristol, BS10 5NB.
Tel. Bristol (STD 0272) 62-2821.

M. SEVERN, MB, MRCPath.
Department of Microbiology, General Hospital, Northampton, NN1 5BD.
Tel. Northampton (STD 0604) 34700.

J. M. STARK, MD, MRCPath, DPath.
Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel. Cardiff (STD 0222) 755944.

Mrs. JOAN E. STOKES, MB, FRCP, FRCPath.
Department of Clinical Pathology, University College Hospital, Gower Street, London, WC1E 6AU.
Tel. 01-387 9300.

M. SUSSMAN, PhD, MIBiol.
Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel. Cardiff (STD 0222) 755944.

R. N. P. SUTTON, MA, DM, DCH.
St. Giles Hospital, St. Giles Road, London, SE5 7RN.
Tel. 01-703 4221.

J. M. TALBOT, MD, MRCPath, Dip.Bact.
Department of Pathology, Kingston Hospital, 37 Coombe Road, Kingston upon Thames, Surrey.
Tel. 01-546 7711.

W. R. G. THOMAS, MB, MRCS, MRCPath, DTM&H, Dip.Bact.
Bacteriology Laboratory, Mayday Hospital, Mayday Road, Thornton Heath, Surrey.
Tel. 01-684 6999.

Professor SCOTT THOMSON, MD, FRCPE, FRCPath, DPH
Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel. Cardiff (STD 0222) 755944.

D. C. TURK, DM, MRCP, MRCPath.
Department of Bacteriology, Radcliffe Infirmary, Oxford.
Tel. Oxford (STD 0865) 49891.

Mrs. BETTY E. WALLACE, MA, MD, FRCPath, BAO.
Department of Clinical Microbiology, Royal Sussex County Hospital, Brighton, BN2 5BE.
Tel. Brighton (STD 0273) 66611.

Professor P. J. WATT, MD, MRCS, MRCP.
Department of Microbiology, Medical and Biological Sciences Building, Bassett Crescent East, Southampton, SO9 3TU.
Tel. Southampton (STD 0703) 559122, *Ext.* 8411.

R. FRASER WILLIAMS, MB, MRCPath.
Department of Pathology, Monsall Hospital, Newton Heath, Manchester, M10 8WR.
Tel. 061-205 2254.

I. ZAMIRI, MD, MRCS.
Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel. Cardiff (STD 0222) 755944.

REFERENCE EXPERTS

Advice and assistance on a number of specialised diagnostic tests is available from reference experts to PHLS and hospital laboratories, as set out in the following list. All regional and many area laboratories of the PHLS undertake routine tests for the diagnosis of virus infections, the serological diagnosis of leptospiral infections, and for the phage typing of *Staphylococcus aureus*; inquiries regarding these tests should be addressed to the local PHLS laboratory.

Amoebiasis, diagnosis of

A. L. Jeanes, MD, FRCPath, Department of Medical Microbiology, Guy's Hospital, London, S.E.1. *Tel.:* 01-407 7600, *Ext.* 578

Anaerobes, identification

A. T. Willis, MD, DSc, PhD, FRCPA, MRACP, MRCPath, Public Health Laboratory, Luton and Dunstable Hospital, Lewsey Road, Luton, LU4 0DZ. *Tel.:* Luton (STD 0582) 52007.

Anthrax bacilli, identification

Miss Joan R. Davies, MD, Dip.Bact. Public Health Laboratory, St. Luke's Hospital, Guildford. *Tel.:* Guildford (STD 0483) 66091.

Anthrax, examination under Wool and Hair Regulations

Miss Joan R. Davies, MD, Dip.Bact. Public Health Laboratory, St. Luke's Hospital, Guildford. *Tel.:* Guildford (STD 0483) 66091.

T. F. Elias-Jones, MB, FRCPath, The City Laboratory, 23 Montrose Street, Glasgow, G1 1RN. *Tel.:* 041-221 9600 and 4348, *Ext.* 2400.

G. L. Gibson, MD, FRCPath. Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.

G. C. Turner, MD, FRCPath, Public Health Laboratory, Fazakerley Hospital, Lower Lane, Liverpool, L9 7AL. *Tel.:* 051-525 2323.

Arboviruses

J. S. Porterfield, MD, MRCS, LRCP, National Institute for Medical Research, Mill Hill, London, NW7 1AA. *Tel.:* 01-959 3666.

Arizona group, identification

B. Rowe, MA, MB, DTM&H, Salmonella and Shigella Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Brucella, identification

D. J. H. Payne, MB, FRCPath, MRCP, DipBact, Public Health Laboratory, St. Mary's General Hospital, East Wing, Milton Road, Portsmouth, PO3 6AQ. *Tel.:* Portsmouth (STD 0705) 22331.

Cholera and related vibrios, Aeromonas, and Plesiomonas

A. L. Furniss, MD, Dip.Bact, Public Health Laboratory, Preston Hall, Maidstone, Kent, ME20 7NH. *Tel.:* Maidstone (STD 0622) 77155.

Additional Reference Expert for *Vibrio cholerae*

P. Cavanagh, MA, MD, BAO, Dip.Bact, Public Health Laboratory, Martin Street, Stafford. *Tel.:* Stafford (STD 0785) 54377.

Clostridium welchii, serological typing

Miss Betty C. Hobbs, OStJ, DSc, FRCPath, Dip.Bact, Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Coxsackie A viruses

D. R. Gamble, MB, MRCPath, Dip.Bact, Public Health Laboratory, West Park Hospital, Epsom. *Tel.:* Epsom 01-78 26633.

Cytomegaloviruses

Professor H. Stern, MB, PhD, FRCPath, Virus Department, St. George's Hospital Medical School, Hyde Park Corner, London, S.W.1. *Tel.:* 01-235 5835.

Regional Centres for Cytomegaloviruses Complement Fixation Tests

Bristol: Suzanne K. R. Clarke, MD, MRCPath, Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. *Tel.:* Bristol (STD 0272) 21326.

Leeds: M. H. Hambling, MD, MRCPath, D(Obst)RCOG, Dip.Bact, Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR. *Tel.:* Leeds (STD 0532) 645011.

Manchester: The Director, Public Health Laboratory, Withington Hospital, Manchester, M20 8LR. *Tel.:* 061-445 2416.

Virus Reference Laboratory: Miss Sylvia D. Gardner, MB, MRCPath, Dip.Bact, Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Diphtheria bacilli, identification of

Professor M. G. McEntegart, MD, FRCPath, Department of Medical Microbiology, The University of Sheffield, Sheffield S10 2TN.
Tel.: Sheffield (STD 0743) 78555.

W. Kwantes, MA, MB, FRCPath, Dip.Bact, Public Health Laboratory, Cockett Road, Swansea, SA2 0FA. *Tel.:* Swansea (STD 0792) 24041.

J. M. S. Dixon, MD, FRCP(C), FRCPath, Dip.Bact, Provincial Laboratory of Public Health, University of Alberta, Edmonton, Alberta, Canada, T6G 2J2.

Drug Resistance in Enterobacteria

Professor E. S. Anderson, MD, FRCPath, Dip.Bact, FRS, Enteric Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Entomological specimens, investigation

B. R. Laurence, PhD, Department of Entomology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT.
Tel.: 01-636 8636.

Escherichia coli, typing

B. Rowe, MA, MB, DTM&H, Salmonella and Shigella Reference Laboratory Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Farmer's lung, serological diagnosis

D. W. R. MacKenzie, PhD, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

D. G. Davies, MD, FRCPath, Dip.Bact, Public Health Laboratory, Cumberland Infirmary, Carlisle. *Tel.:* Carlisle (STD 0228) 23654.

B. Moore, MD, BSc, FRCPath, Public Health Laboratory, Church Lane, Heavitree, Exeter, EX2 5AD. *Tel.:* Exeter (STD 0392) 51251.

H. D. S. Morgan, MRCS, FRCPath, Dip.Bact, Public Health Laboratory West Wales General Hospital, Glangwili, Carmarthen.
Tel.: Carmarthen (STD 0267) 7271.

M. Sussman, PhD., MIBiol, Department of Medical Microbiology, The Welsh National School of Medicine, Heath Park, Cardiff, CF4 4XN.
Tel.: Cardiff (STD 0222) 755944.

D. M. Weir, MD, Immunology Laboratory, Department of Bacteriology, Edinburgh University Medical School, Teviot Place, Edinburgh.
Tel.: 031-667 1011, *Ext.* 2256.

Fungi (*pathogenic*), identification

D. W. R. Mackenzie, PhD, Mycological Reference Laboratory, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Helminthological specimens, investigation

Professor G. S. Nelson, MD, DSc, MRCP, TDM&H, DAP&E, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Hydatid disease, complement-fixation test for

Mrs. C. M. Patricia Bradstreet, MB, FRCPath, Dip.Bact, Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Immunofluorescence

C. E. D. Taylor, MA, MD, FRCPath, Dip.Bact, Central Middlesex Hospital, Park Royal, London, NW10 7NT. *Tel.:* 01-965 5733.

Influenza

Mrs. Marguerite S. Pereira, MD, Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Listeria, typing

Mrs. Agnes J. Macara, BSc, Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Malaria, diagnosis See *Protozoa*

Meningococci, typing

Mrs. C. M. Patricia Bradstreet, MB, FRCPath, Dip.Bact, Standards Laboratory for Serological Reagents, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Parasitic infections, serological diagnosis of

D. S. Ridley, BSc, MD, FRCPath, Department of Pathology, Hospital for Tropical Diseases, 4 St. Pancras Way, London, NW1 0PE. *Tel.:* 01-387 4411. (Tests available for *Chagas' disease*, *Cysticercosis*, *Fascioliasis*, *Filariasis*, *Kala azar*, *Schistosomiasis*, *Trichinosis*),

Plague, investigation

R. J. Henderson, MD, Public Health Laboratory, Royal Infirmary, Castle Street Branch, Worcester, WR1 3AS. *Tel.:* Worcester (STD 0905) 25238/9.

Pneumococci, typing of, from epidemics

M. T. Parker, MD, FRCPath, Dip.Bact, Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Poliomyelitis, marker tests

Miss Yvonne E. Cossart, MB, BSc, MRCPath, DCP, Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Protective cabinets

O. M. Lidwell, DPhil, Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Protozoa of the blood, tissues and intestine, including malaria

Professor W. H. R. Lumsden, DSc, MB, FRCPE, DTM, DTH, FRSE, Department of Medical Protozoology, London School of Hygiene and Tropical Medicine, Keppel Street, London, WC1E 7HT. *Tel.:* 01-636 8636.

Psittacosis, isolation of causative agent

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Rabies, laboratory tests for diagnosis

Miss Sylvia D. Gardner, MB, MRCPath, Dip.Bact, Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Rickettsia

A. D. Evans, MB, BSc, MRCPath, Dip.Bact, Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Shigella sonnei, confirmation and typing

Miss Joan R. Davies, MD, Dip.Bact, Public Health Laboratory, St. Luke's Hospital, Guildford, Surrey. *Tel.:* Guildford (STD 0483) 66091.

Smallpox, laboratory tests for diagnosis

Birmingham: H. S. Bedson, MD, MRCP,
Professor P. Wildy, MB, MRCS, FRSE,
Department of Virology, The University, Birmingham, B15 2TJ.
Tel.: 021-472 1301. *Night extension:* 021-472 3524.

Bristol: Miss Suzanne K. R. Clarke, MD, FRCPath, Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. *Tel.:* Bristol (STD 0272) 21326.

Cardiff: A. D. Evans, MB, BSc, MRCPath, Dip.Bact, Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944.

Leeds: M. H. Hambling, MD, MRCPath, D(Obst.)RCOG, Dip.Bact, Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR.
Tel.: Leeds (STD 0532) 645011.

Liverpool: Professor K. McCarthy, MD, FRCPath, Department of Medical Microbiology, New Medical School, University of Liverpool. P.O. Box 147, Liverpool, L69 3BX. *Tel.:* 051-709 6022 *Ext.* 202.

London: Mrs. Marguerite S. Pereira, MD, Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.
Tel.: 01-205 7041.

Newcastle: J. H. Hale, OBE, MD, FRCPath, MRCP, Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

Staphylococcal enterotoxin, typing

R. J. Gilbert, MPS, MPharm, PhD, MRCPath, Dip.Bact, Food Hygiene Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Staphylococci, bacteriophage-typing

M. T. Parker, MD, FRCPath, Dip.Bact, Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Streptococci of Group A, typing

M. T. Parker, MD, FRCPath, Dip.Bact, Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

Regional Typing Laboratories

Northern Counties

G. L. Gibson, MD, FRCPath, Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR. *Tel.:* Leeds (STD 0532) 645011.

Eastern Counties

Miss Joan M. Boissard, MRCS, Public Health Laboratory, Tennis Court Road, Cambridge, CB2 1QR. *Tel.:* Cambridge (STD 0223) 55526 and 57573.

Western Counties

Public Health Laboratory, Radcliffe Infirmary, Oxford, OX2 6AH.
Tel.: Oxford (STD 0865) 49231/2.

Wales

C. H. L. Howells, BSc, MD, FRCPath, Public Health Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944

Streptococci of Groups B and D, typing; *other Streptococci*, identification

M. T. Parker, MD, FRCPath, Dip.Bact, Cross-Infection Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT.

Toxoplasmosis

North

G. B. Ludlam, MD, FRCPath, DTM&H, DLO, Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR. *Tel.:* Leeds (STD 0532) 645011.

South (excluding London)

W. Kwantes, MA, MB, FRCPath, Dip.Bact, Public Health Laboratory, Cockett Road, Swansea, SA2 0FA. *Tel.:* Swansea (STD 0792) 24041.

London

D. G. Fleck, MD, MRCPath, Dip.Bact, Public Health Laboratory, St. George's Hospital, Blackshaw Road, London, SW17 0QT. *Tel.:* 01-672 1255.

Trichinosis, examination of rats and pigs

Professor G. S. Nelson, MD, DSc, MRCP, DTM&H, DAP&E, London School of Hygiene & Tropical Medicine, Keppel Street, London, WC1E 7HT.
Tel.: 01-636 8636.

Tubercle bacilli and other mycobacteria

J. Marks, MD, FRCP, FRCPath, Dip.Bact, Tuberculosis Reference Laboratory, University Hospital of Wales, Heath Park, Cardiff, CF4 4XW.
Tel.: Cardiff (STD 0222) 755944, *Ext.* 2049.

Regional Centres for Tuberculosis Bacteriology

Birmingham: F. A. J. Bridgwater, MB, MRCPath, Dip.Bact, Public Health Laboratory, East Birmingham Hospital, Bordesley Green East, Birmingham, B9 5ST. *Tel.:* 021-772 4311.

Bristol: H. R. Cayton, MB, FRCPath, Public Health Laboratory, Myrtle Road, Kingsdown, Bristol, BS2 8EL. *Tel.:* Bristol (STD 0272) 291326.

Leeds: G. L. Gibson, MD, FRCPath, Public Health Laboratory, Bridle Path, York Road, Leeds, LS15 7TR. *Tel.:* Leeds (STD 0532) 645011.

Liverpool: G. C. Turner, MD, FRCPath, Public Health Laboratory, Fazakerley Hospital, Lower Lane, Liverpool, L9 7AL. *Tel.:* 051-525 2323.

London: C. H. Collins, MBE, MIBiol, FIMLT, Public Health Laboratory, Dulwich Hospital, East Dulwich Grove, London, SE22 8QF.
Tel.: 01-693 3377.

Manchester: J. D. Abbott, MD, FRCPath, Dip.Bact, Public Health Laboratory, Withington Hospital, Manchester, M20 8LR. *Tel.:* 061-445 2416.

Newcastle: J. B. Selkon, MB, MRCPath, DCP, Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 276/7.

Typhus fever, serological tests*

Virus Reference Laboratory, Central Public Health Laboratory, Colindale Avenue, London, NW9 5HT. *Tel.:* 01-205 7041.

---

* The Weil-Felix test can be carried out in all constituent laboratories of the Service, and also in a number of hospital laboratories. Only sera giving a doubtful reaction should be sent to the Virus Reference Laboratory.

Venereal diseases, Treponemal immobilisation test

A. E. Wilkinson, MB, FRCPath, MRCS, Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, Ashfield Street, London, E1 2BL. *Tel.:* 01-790 3008.

J. H. Hale, OBE, MD, FRCPath, MRCP, Public Health Laboratory, Institute of Pathology, General Hospital, Westgate Road, Newcastle upon Tyne, NE4 6BE. *Tel.:* Newcastle (STD 0632) 38811, *Ext.* 297.

P. J. L. Sequiera, MB, The Central Serology Laboratory, Withington Hospital, West Didsbury, Manchester, M20 8LR.
Tel.: Manchester (STD 061-445) 7683.

Vibrio parahaemolyticus

G. I. Barrow, MD, MRCPath, Dip.Bact, Public Health Laboratory, Royal Cornwall Hospital (City), Infirmary Hill, Truro.
Tel.: Truro (STD 0872) 3029.

Yersinia pseudotuberculosis and Yersinia enterocolitica

N. S. Mair, MB, FRCPath, DCH, DPH, Dip.Bact, Public Health Laboratory, Groby Road Hospital, Leicester, LE3 9GE.
Tel.: Leicester (STD 0533) 872283.

VACCINES AND OTHER IMMUNOLOGICAL MATERIALS OBTAINABLE THROUGH THE PUBLIC HEALTH LABORATORY SERVICE

For the address of PHLS laboratories *see* pp. 8–19

**Rabies Vaccine and Antiserum*

Stocks are held by the PHLS laboratories at:

Liverpool
London (Colindale)
Newcastle
Cardiff

Anthrax Vaccine

Stocks are held by the PHLS laboratories at:

Leeds
Liverpool
London (Colindale)

**Anti-vaccinia human immunoglobulin*

In addition to normal human immunoglobulin, a stock of immunoglobulin prepared from the blood of persons recently vaccinated against smallpox is held for the treatment of cases of generalised vaccinia, eczema vaccinatum, accidental vaccinia infections endangering the eye, and, in special circumstances, for the protection of unvaccinated smallpox contacts. This anti-vaccinia human immunoglobulin may be obtained from the PHLS laboratories at:

Birmingham
Bristol
Cambridge
Cardiff
Gloucester
Leeds
Leicester
Liverpool
London (Colindale)
Manchester
Newcastle
Oxford
Sheffield

Material for intradermal diagnostic tests

Frei antigen for lymphogranuloma inguinale, brucellin for undulant fever, trichina antigen for trichinosis, hydatid antigen for hydatid disease, Kveim antigen for sarcoidosis and cat-scratch fever antigen can be obtained from the PHLS Standards Laboratory.

Enquiries relating to fungal antigens should be addressed to the PHLS Mycology Reference Laboratory.

Human immunoglobulin for use with measles vaccine, and immunoglobulin for the prevention of infectious hepatitis and rubella is obtainable from local health authorities.

---

* Urgent requests for rabies vaccine or antiserum and anti-vaccinia human immunoglobulin only are received at any time at the Central Public Health Laboratory, Colindale.

Notes on other immunological materials obtainable from special centres:

1. *Antisera for therapeutic use*

Obtainable through the Hospital Pathological Service (see appendix to HM (71)64) from which the list below is abstracted:

(a) anthrax antiserum
(b) botulinum antitoxin
(c) human antitetanus immunoglobulin
(d) ovine antitetanus serum

Note: L = Pathology Laboratory
P = Pharmacy

Region 1

L	Carlisle, Cumberland Infirmary	abcd
P	Newcastle, General Hospital	abcd
	Catterick, O.C. Military Hospital	c

Region 2

P	Hull, Castle Hill Hospital	abcd
P	Leeds, Seacroft Hospital	abcd

Region 3

P	Nottingham, City Hospital	abcd

Region 4

	Cambridge, Director, Regional Transfusion Centre	abcd

Region 5

P	London, N.7, Royal Northern Hospital	a
P	Edgware, General Hospital	bcd

Region 6

L	London, N.18, North Middlesex Hospital	abcd
	Colchester, O.C. Military Hospital	c

Region 7

	Southborough, Director, S.E. Depot, Blood Transfusion Centre	abcd

Region 8

	Tooting, Director, South London Transfusion Centre, Tooting Grove	abcd
	Aldershot, O.C. Cambridge Military Hospital	c
P	Epsom District Hospital	b

Region 9

L	Northampton, General Hospital	abcd
P	Reading, Royal Berks. Hospital	abcd
P	Oxford, Churchill Hospital (day only)	c
P	Oxford, Radcliffe Infirmary (day only)	d

Region 10

P	Bristol, Ham Green Hospital	abcd
P	Exeter, Royal Devon and Exeter Hospital	abcd
	Plymouth, O. i/c Accident Department, General Hospital, Freedom Fields	abcd
P	Truro, Royal Cornwall Hospital, Treliske Branch	abcd

Region 11

P	Cardiff, Royal Infirmary	abcd
P	Bangor, Caernarvon and Anglesey General Hospital	abcd
P	Wrexham, Maelor General Hospital	abcd
P	Swansea, Singleton Hospital, Sketty	ab
P	Carmarthen, West Wales General Hospital	cd
P	Aberystwyth, Bronglais District General Hospital	cd

Region 12

P	Shrewsbury, Royal Salop Infirmary	acd
P	Birmingham 29, Selly Oak Hospital	abcd
P	Stoke-on-Trent, North Staffs Royal Infirmary	acd

Region 13

P	Manchester, Royal Infirmary	abcd

Region 14

P	Liverpool 9, Fazakerley Hospital	abcd

Region 15

P	Southampton, Royal South Hants Hospital	abcd
P	Salisbury, Odstock Hospital	a
	Salisbury, Officer-in-Charge, Accident Department, General Hospital	cd
L	Dorchester, Director, Public Health Laboratory	cd
P	Portsmouth, Royal Portsmouth Hospital	cd

2. *Yellow fever inoculation*
   A list of centres can be obtained from the Department of Health and Social Security, Alexander Fleming House, Elephant and Castle, London, S.E.1.

3. *TABC, cholera, typhus and other vaccines*
   Most of these are available commercially.

4. *Smallpox Vaccine*
   Obtainable from Local Health Authorities.

PRINCIPAL COMMITTEES

Communicable Disease Report Standing Advisory Committee

Chairman: Dr. T. M. Pollock
Secretary: Mrs. Enid D. Vernon

Dr. H. R. Cayton
Mr. W. B. Fletcher
Dr. G. L. Gibson
Dr. M. H. Hughes
Dr. J. C. Kelsey
Dr. S. P. Lapage
Dr. E. R. Mitchell

Dr. B. Moore
Dr. C. A. Morris
Dr. N. D. Noah
Dr. J. W. G. Smith
Mrs. Hilary E. Tillett
Dr. J. O'H. Tobin
Mr. R. H. Westlake

Joint Public Health Laboratory Service/Animal Health Division Standing Advisory Committee

PHLS Members
Professor E. S. Anderson
Dr. J. H. McCoy
Dr. D. J. H. Payne

Veterinary Members
Mr. R. Blamire
Mr. M. L. Burdin
Mr. E. Lowes

Professor W. R. Kelly (*Dublin*)
Professor P. N. Meenan (*Dublin*)

Standing Advisory Committee on Influenza

Chairman: Dr. P. G. Mann
Secretary: Dr. J. W. G. Smith

Dr. R. J. C. Hart
Dr. C. H. L. Howells
Dr. Hélène J. Mair
Dr. E. R. Mitchell
Dr. M. T. Parker

Dr. Marguerite S. Pereira
Dr. W. N. Dunnett (*Department of Health and Social Security*)
Professor D. L. Miller (*Middlesex Hospital, London*)

Standing Advisory Committee on Monographs

Convenor: Dr. C. H. L. Howells

- Mr. C. H. Collins
- Dr. Yvonne E. Cossart
- Dr. J. W. G. Smith
- Dr. A. T. Willis
- Dr. P. J. Wormald

Standing Advisory Committee on Quality Control

Chairman: Dr. R. Blowers
Secretary: Dr. J. D. Abbott

- Dr. P. B. Crone
- Mr. W. B. Fletcher
- Dr. R. D. Gray
- Dr. R. J. C. Hart
- Dr. M. H. Hughes
- Dr. S. P. Lapage
- Dr. J. H. McCoy
- Dr. C. E. D. Taylor
- Dr. Mair E. M. Thomas
- Mr. J. D. Whittaker
- Dr. C. L. Greenbury (*Stoke Mandeville Hospital*)
- Dr. A. C. Scott (*Department of Bacteriology, University of Dundee*)
- Dr. E. Joan Stokes (*University College Hospital, London*)

Standing Advisory Committee on Technicians

Chairman: Dr. R. J. Henderson
Secretary: Mr. B. D. Cunningham

- Dr. B. W. Barton
- Dr. H. R. Cayton
- Mr. C. H. Collins
- Dr. P. K. Fraser
- Mr. G. V. Heimer
- Dr. J. C. Kelsey
- Mr. J. R. McDonald
- Mr. W. A. Sutcliffe
- Dr. J. O'H. Tobin
- Dr. J. G. Wallace
- Dr. P. J. Wormald

Standing Advisory Committee on Viral Reagents

Chairman: Dr. C. M. Patricia Bradstreet
Secretary: Mrs. E. Margaret Supran

- Dr. Suzanne K. R. Clarke
- Dr. J. V. T. Gostling
- Dr. P. G. Higgins
- Dr. Marguerite S. Pereira
- Dr. J. O'H. Tobin
- Dr. G. B. B. White

Standing Sub-Committee on Laboratory Supplies

Chairman: Dr. Joan R. Davies
Secretary: Mr. A. Waltho

Mr. T. J. Donovan
Mr. L. J. Haughton
Mr. J. R. McDonald
Dr. E. R. Mitchell
Dr. D. J. H. Payne

Standing Sub-Committee for Library

Joint Chairmen: Dr. B. Moore, Miss Betty H. Whyte
Secretary: Miss Betty H. Whyte

Dr. D. G. Davies
Dr. R. D. Gray
Dr. D. W. R. Mackenzie
Dr. E. R. Mitchell
Dr. G. R. E. Naylor
Dr. Marguerite S. Pereira

Standing Sub-Committee on the Bacteriological Examination of Water Supplies

Chairman: Dr. G. I. Barrow
Secretary: Dr. J. A. Rycroft

Dr. R. D. Gray
Dr. J. H. McCoy
Dr. A. J. Kingsley Smith
Miss Joan M. Watkinson
Dr. A. E. Wright

Sub-Committee on Farmer's Lung

Chairman and Secretary: Dr. D. W. R. Mackenzie

Dr. G. I. Barrow
Dr. D. G. Davies
Dr. B. Moore
Dr. H. D. S. Morgan
Dr. C. A. Morris
Dr. J. V. S. Pether
Miss Christine M. Philpot
Dr. J. M. Dunbar (*Queen's University, Belfast*)
Dr. M. Sussman (*Welsh National School of Medicine, Cardiff*)
Dr. D. M. Weir (*Edinburgh University Medical School*)

Sub-Committee on Hepatitis

Chairman: Dr. Yvonne E. Cossart
Secretary: Dr. Sheila Polakoff

- Dr. C. M. Patricia Bradstreet
- Dr. Susanne K. R. Clarke
- Dr. A. D. Evans
- Dr. J. V. T. Gostling
- Dr. J. H. Hale
- Dr. M. H. Hambling
- Dr. R. J. C. Hart
- Dr. D. M. Jones
- Dr. J. Nagington
- Dr. G. C. Turner
- Dr. Margaret A. M. Wilson
- Dr. T. H. Flewett (*Regional Virus Laboratory, Birmingham*)
- Dr. F. O. MacCallum (*Radcliffe Infirmary, Oxford*)

Sub-Committee on Microbiological Specification for Food

Chairman: Dr. Betty C. Hobbs

- Dr. G. I. Barrow
- Dr. H. R. Cayton
- Dr. Joan R. Davies
- Dr. C. Dulake
- Dr. R. J. Gilbert
- Dr. R. W. S. Harvey
- Dr. R. J. Henderson
- Dr. W. L. Hooper
- Dr. H. H. Johnston
- Dr. J. H. McCoy
- Dr. D. A. McSwiggan
- Dr. P. G. Mann
- Dr. N. J. Mitchell
- Dr. B. Moore
- Dr. L. Robertson
- Dr. B. Rowe
- Dr. A. J. Kingsley Smith
- Dr. Mair E. M. Thomas
- Miss Joan M. Watkinson

Sub-Committee on Safety Requirements for the Installation and Preparation of Centrifuges

Chairman: Dr. M. T. Parker

- Dr. Joan R. Davies
- Dr. J. C. Kelsey
- Dr. O. M. Lidwell
- Mr. A. Waltho

Designated Advisers

Office Equipment and Methods: Dr. J. H. Hale
Application and Report Forms: Dr. R. Pilsworth

REPORT OF THE DIRECTOR FOR 1973

The Public Health Laboratory Service has two main responsibilities: to identify infecting agents by the microbiological examination of specimens from man and other sources, and to study the origins, effects and prevention of these infections by epidemiological investigations. Spanning both microbiology and epidemiology, the PHLS has a duty to conduct research into the improvement of microbiological techniques, the understanding of microbes and microbial diseases, and of the microbial hazards to which the population is exposed.

In recent years the Director's Report has concentrated on a few accounts of important topics under research or development in the Service. This year it has been thought useful to present a more detailed summary of the ' routine ' activities of the laboratories and to describe their research activities in a broader, although still highly selective, review.

ROUTINE MICROBIOLOGY

The numerical returns of the microbiological examinations carried out in the Regional and Area Laboratories are summarized in Table 1 (*page* 44). Such statistics have limited use, partly because of the great variation in work and thought demanded by different categories of tests and partly because in joint PHLS/Hospital laboratories there are variations in the way in which the workload is allocated between PHLS and Hospital resources. Nevertheless the total number of specimens received reached nearly 5 million. The most impressive change over previous years was in sera received for antibody determination (up to 30 per cent more) due largely to the expansion of testing for rubella antibodies.

The provision of clinical advice is a function of consultant microbiologists in all medical laboratories; the provision of epidemiological advice to medical officers of health and public health inspectors, as well as to hospital clinicians and administrators, is an additional function for PHLS consultants and commonly takes a substantial part of their time. Although large outbreaks which require the urgent deployment of substantial resources from a single laboratory are not common (for example, there were only 7 food-poisoning outbreaks involving more than 100 persons reported in 1973), small food-poisoning incidents and sporadic salmonella infections that require elucidation in case they are part of a wider epidemic are continually occurring. And the monitoring of the microbiological content of food, milk and water, though simple and routine at the laboratory bench, often requires interpretation and discussion with local health officers. The spread of container traffic means that imported food has often to be examined in areas far removed from ports, and new foods from new sources continue to provide new problems.

Table 1

Estimated Number of Specimens Received in Area and Regional PHLS Laboratories

	1973
Humans	
Isolation of bacteria	3,489,000
Isolation of viruses	80,300
Determination of antibodies	976,000
Animals	
Isolation of bacteria	7,500
Milk, Cream, Water	
Bacteriological quality	279,000
Food	48,600
Other Sanitary	86,800
TOTAL	4,967,200

Table 2

Special Diagnostic Facilities in Regional and Area Laboratories

Tests	Number of laboratories providing the facility
Bacterial typing	
Staphylococcus aureus	26
Streptococcus spp.	6
Pseudomonas aeruginosa	8
Shigella sonnei, Neisseria, Brucella, Escherichia coli, Yersinia, Vibrio	1–3 each
Bacterial antibodies	
Antistreptolysin 0	30
Leptospira	7
Farmer's Lung	3
Venereal Disease	36
Mycobacterium identification and sensitivity	10
Virus isolation	51
Virus antibodies	
Rubella	49
HB Ag	19
Other	50

Table 3

Workload of Reference Laboratories, 1973

Laboratory	No. of bacteria/ virus etc. for identification or other examination	No. of sera for antibody	Other
Cross-Infection:			
Staphylococcus	21,350	793	—
Streptococcus	3,636	1,983	—
" Gram-negative " typing	3,870	—	—
Enteric	15,227	—	—
Food Hygiene	1,137†	—	4,197 food samples
Leptospirosis	—	1,520	—
Mycology	2,368	5,537	—
Mycoplasma	161	58	3,821 primary isolation
National Collection of Type Cultures and Computer Trials	102	—	5,643 ampoules issued 71,429 ampoules dried
Salmonella and Shigella	14,280	—	—
Standards	921	902	225,325 ml. bacterial suspensions issued 30,019 ml. bacterial antisera issued 19,779 ml. viral antigens issued 8,498 ml. viral antisera issued 6,753 ampoules skin tests issued
Tuberculosis (Cardiff)*	35,320	—	—
Venereal Diseases	26	14,800	—
Virus	2,216	20,629	—

* Sensitivity tests for *M. tuberculosis* are also carried out in 6 regional and some other laboratories.

† Mostly type identification of *Clostridium welchii.*

All Regional and many Area Laboratories provide some reference facilities for other laboratories; these are listed in Table 2 (*page* 44). The diagnosis of virus infections constitutes the most important of these activities, if only because a very great part of the virus diagnostic facilities for England and Wales is provided in PHLS or joint PHLS/Hospital laboratories. Some 80,000 specimens were tested for the presence of viruses by culture and nearly half a million sera were examined for evidence of viral infection. In addition, a number of laboratories have a special interest and expertise with particular micro-organisms such as *Yersinia spp.* at Leicester, *Vibrio parahaemolyticus* at Truro and meningococci at Manchester: in this they supplement the work of the Reference laboratories. The type identification of staphylococci, usually required in the investigation of hospital infection, is provided in 26 PHLS laboratories, as well as in the Cross Infection Reference Laboratory; altogether some 72,000 strains were tested in 1973.

The description of the workload of the Reference Laboratories is even more difficult than that for the Area laboratories because of their heavy commitments to research and advisory work. But the figures set out in Table 3 (*page* 45) are a striking illustration of the considerable number of specimens examined by the laboratories. Comparative figures for previous years are not readily available, but there is little doubt that the numbers have increased substantially; any further increase is severely limited by lack of space, unless techniques can be adapted to enable more work to be done in existing space, or with fewer workers.

COMMUNICABLE DISEASE SURVEILLANCE

The PHLS studies the epidemiological aspects of communicable diseases in England and Wales in two ways. The first is by the regular collection and analysis of the reports of infections diagnosed in PHLS and hospital laboratories (reported in the weekly Communicable Disease Report). These returns are of great importance to the understanding of infectious disease because they relate to infections that have been confirmed by laboratory examination. Moreover, the returns are the only source of epidemiological data on non-notifiable infectious diseases. The second way in which the epidemiology is studied is by special surveys, usually of a single type of infection during a defined period and organised to collect detailed information on various points. Some examples of the information received from this surveillance work of the PHLS may be summarized here.

Virus infections. Influenza is certainly one of the most important of the communicable diseases now prevalent in Britain, but the epidemic illnesses due to influenza viruses can only be distinguished from the great variety of other respiratory infections by laboratory methods; for this reason among others, assessment of the prevalence and progress of virus influenza has always been difficult. In 1971 the PHLS set out to make a detailed study of the occurrence of influenza utilising all available sources of epidemiological information; these include general practitioner consultation rates for respiratory illness, hospital admissions, mortality statistics, industrial sickness absence rates and new claims for sickness benefits, school sickness absence rates and laboratory isolations of influenza virus. A pilot study was conducted in five areas in 1971/2 which examined the spread of influenza as indicated by the number of viruses isolated, general practioner consultation rates, number of deaths (from all causes) and new sickness benefit claims.

For the winter of 1972/3 the survey was extended to cover 17 areas, and it provided a detailed picture of the first outbreak of influenza due to the new variant virus (A/England/42/72), which started in November 1972, reached a peak in mid-December and declined to insignificance by the end of February 1973. This outbreak had a very small effect on new sickness benefit claims and it was estimated that only about 2 per cent of the working population suffered from an attack of true virus influenza during 1972-3 winter. Nevertheless, there was a substantial mortality, with nearly 4,000 deaths attributed to influenza and influenzal pneumonia, and an apparent excess mortality compared with a recent influenza-free year of 21,000.

This type of collaborative surveillance will be continued for several years and should provide a much clearer picture than anything hitherto available of the occurrence of the influenza viruses in England and Wales. The analyses for 1974 will be particularly interesting because the autumn of 1973 witnessed the recrudescence of epidemics of influenza B and the appearance of a new serological variant of influenza A (A/Port Chalmers/73) first recognised in New Zealand, as well as a number of incidents due to the earlier A/Eng/42/72 strain.

A number of other virus infections occurred in especially large numbers during 1973. Coxsackie virus A16 is an organism that has a tendency to epidemic prevalence every three years, peaks having occurred in 1964, 1967 and 1970; a widespread increase in prevalence was seen in 1973. Apart from a variety of undifferentiated pyrexial illnesses, encephalitis and occasional paralytic disease, Coxsackie A16 was responsible for outbreaks of hand, foot and mouth disease in the Bristol area and in Norfolk, and since there is good reason to think that this disease can often go undiagnosed, there may well have been other epidemics elsewhere.

Adenovirus type 7 is not generally a particularly common serotype, but in late 1972 and early 1973 the routine returns showed a substantial increase (Fig. 1—*page* 48) in Southern England and the Midlands. As with most viruses, infection was associated with a wide variety of symptoms, but among children respiratory symptoms occurred in more than half, whereas in adults by far the most common symptom was conjunctivitis.

The year 1973 was also characterized by an outbreak of Echovirus type 9, the first since 1969 (Fig. 2—*page* 49). Infection was identified much more often in children than in adults and the relative frequency of certain symptoms differed among the age groups. Only 20% of the infected children under 5 years of age had meningitis, whereas in older children and adults this proportion was no less than 70%. Most of the remaining symptoms were pyrexia, upper respiratory and gastro-intestinal. Lasy year (1973) saw the end of a country-wide ‘ epidemic ’ of infection with *Mycoplasma pneumoniae* (Fig. 3—*page* 50) which occurred in 1971 and 1972 and which went largely unnoticed at the time because of the benign nature of the illness.

These epidemics—of Coxsackie virus A16, Adenovirus 7 and *M. pneumoniae*—can be detected only by a system of country-wide reporting with central collation and analysis of laboratory records. Apart from their intrinsic interest and importance for appreciation of the prevalence of the acute illnesses, the tentative indications of an association of virus infection and later neurological illness and

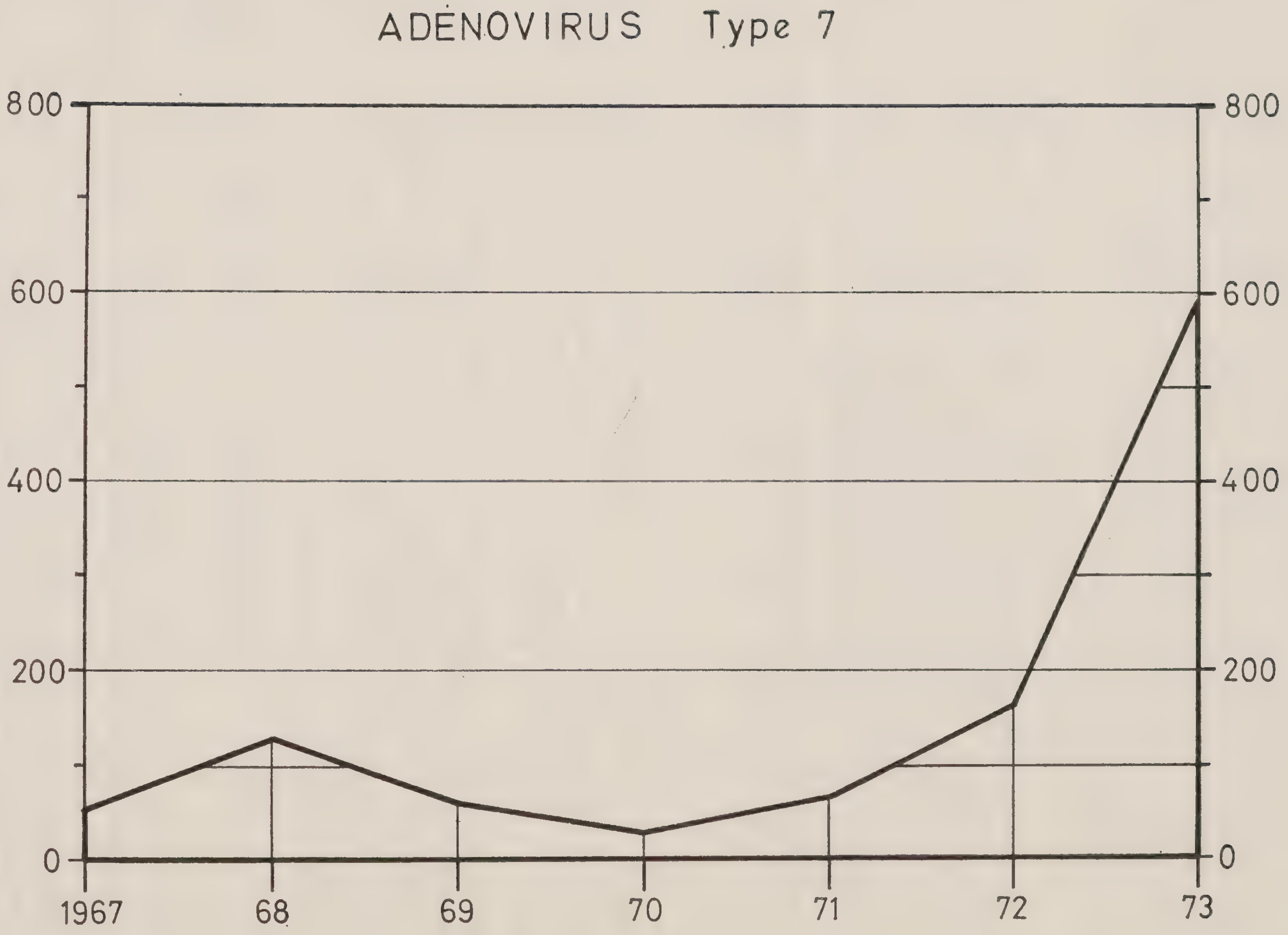


Fig. 1.

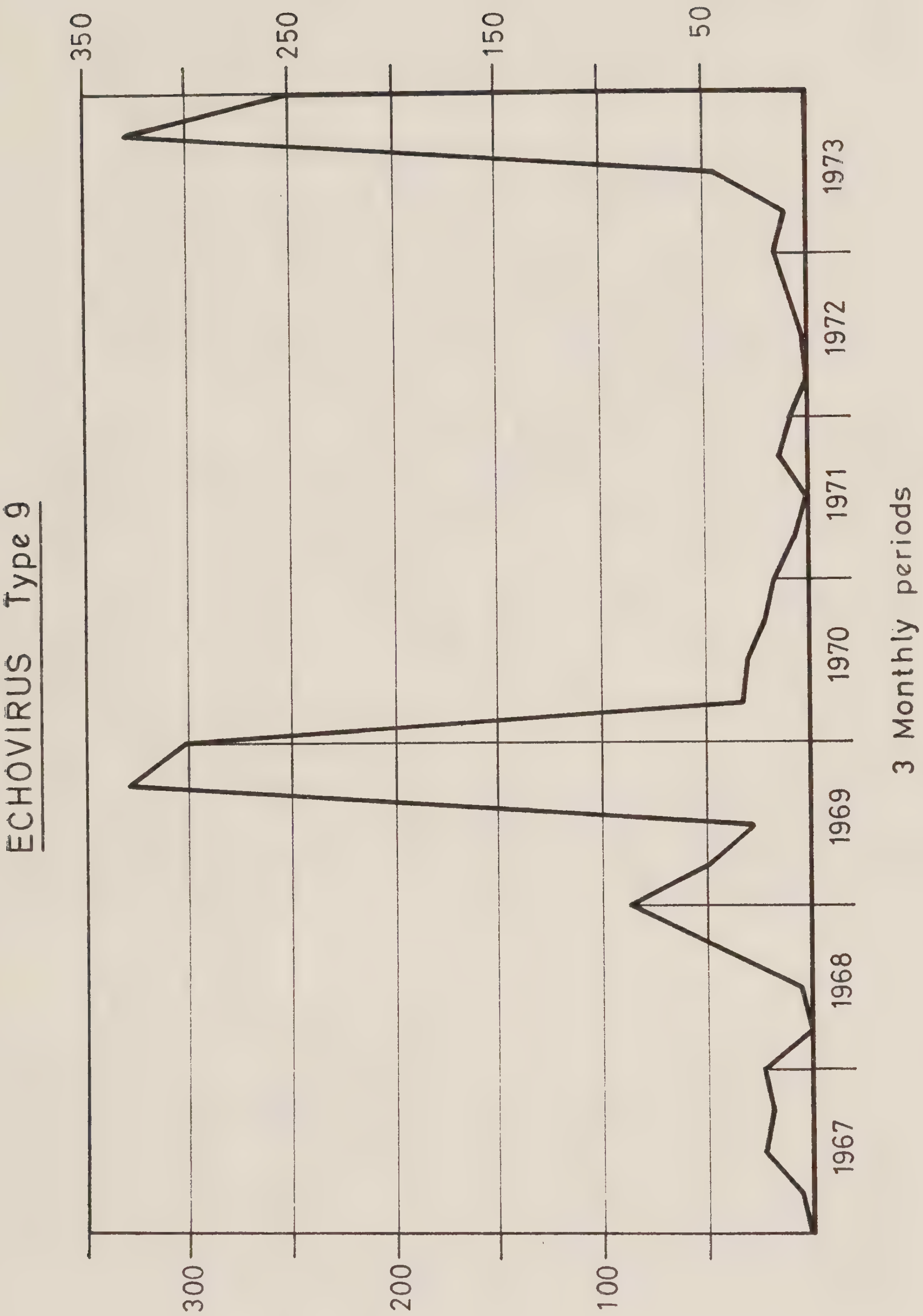

ECHOVIRUS Type 9
350
250
150
50
300
200
100
1967
1968
1969
1970
1971
1972
1973
3 Monthly periods

Fig. 2.

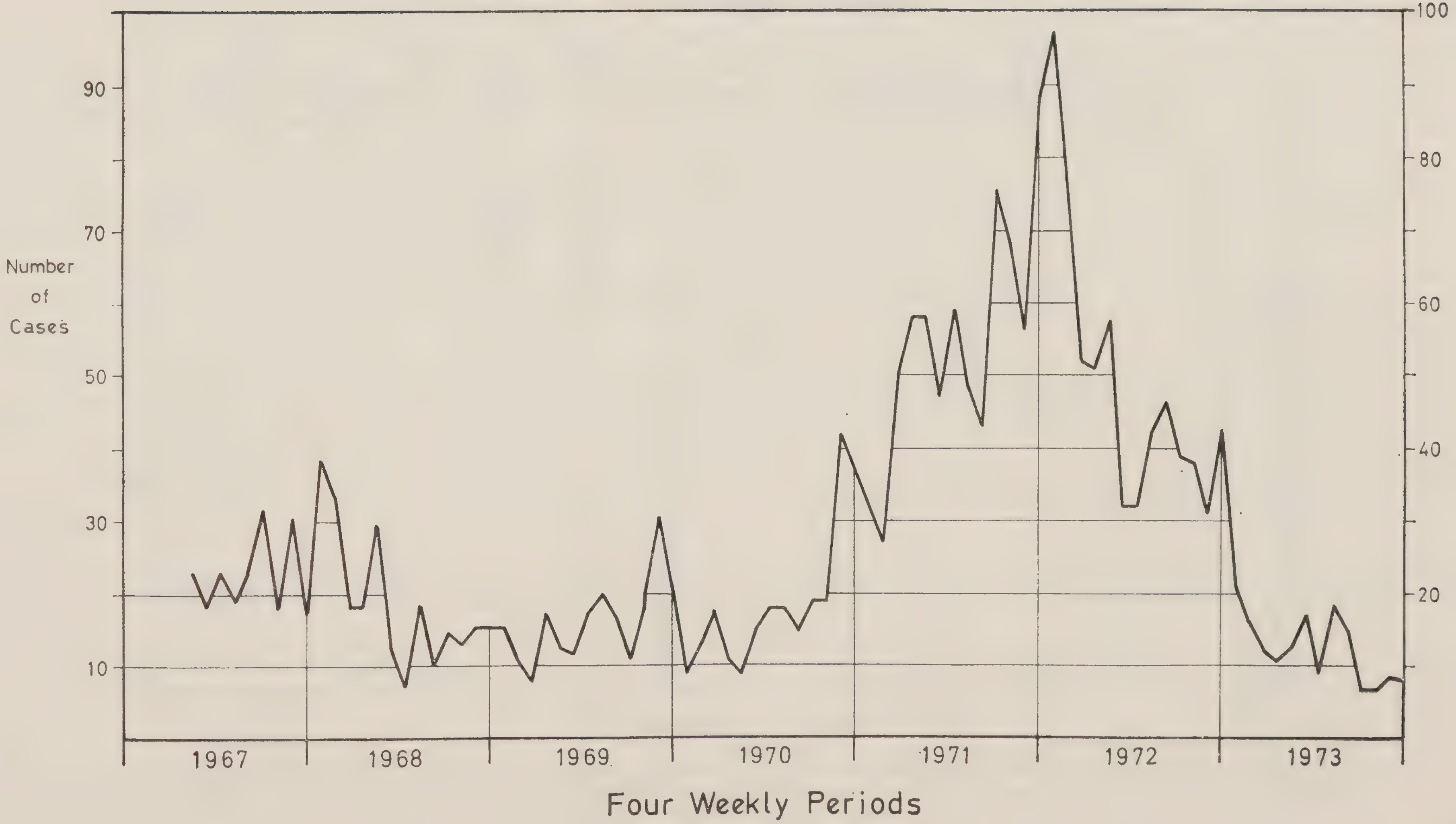

MYCOPLASMA PNEUMONIAE

Fig. 3.

of the many viruses now implicated in congenital defect, emphasize the importance of this form of surveillance and of the special surveys needed to explore these associations.

The number of cases of psittacosis reported to laboratories continued to increase and there is every reason to think that the average figure of 129 for infections reported each year seriously underestimates the prevalence of this infection, which is often mild and generally responds readily to tetracycline. Occasional serious infections, with meningitis, myocarditis or endocarditis, also occur. Where a source for the infection can be traced, there often is a history of contact with parrots or pigeons.

Bacterial infections. Bacterial food poisoning continues to be reported at a frequency that shows little sign of any consistent change from year to year. By far the greatest number of cases are attributable to salmonella infection and although *S. typhimurium* continues to be the most common, a number of other serotypes, particularly *S. agona* and *S*4.12:*d*, have become very common. Infections with these serotypes are typically contracted from poultry or pork and are thought to originate from contaminated imported feedstuffs.

A relative newcomer to the list of food-poisoning bacteria is *Bacillus cereus* which has been found to cause a number of incidents, all associated with the consumption of Chinese fried rice. The organism has been isolated from uncooked rice and may survive the cooking process and multiply during the subsequent storage, which cannot satisfactorily be in a refrigerator.

Vibrio parahaemolyticus has achieved some publicity from the production of outbreaks of food-poisoning in aircraft (see PHLS Annual Report for 1972); the vibrio can be isolated from sea-food imported into Britain, and from some native sea-food. One indigenous outbreak has been recognised attributable to prepared crab meat.

It is not possible at present to gain any general view of the incidence of hospital-acquired infection, but there have been a number of reports of an increase in staphylococcal infections in newborn infants after the cessation of hexachlorophane bathing and a survey has now been initiated to assess the magnitude of this problem.

SURVEILLANCE OF VACCINATION PROGRAMME

National policy for prophylactic immunization must be based, not only on an assessment of the protective value of a particular vaccine before it can be introduced generally, but also on follow-up studies of those vaccines in general use to determine whether their effectiveness is maintained in what may be the changing circumstances of a decline in infection rate. And, as the incidence of an infection declines, studies of the possible complications of the vaccination itself become relatively more important. The PHLS has played an important part in all these activities.

The Epidemiological Research Laboratory is conducting a long series of studies to assess the value of vaccination against influenza, and to determine the best type of vaccine and the circumstances or populations in which vaccination is appropriately used. With measles vaccination, now generally available, the problem is different, and studies are in progress to determine how long protection from the vaccines will last into adult life, especially in circumstances where boosting from natural exposure can no longer be frequent. Vaccination against whooping cough was introduced after a series of carefully controlled trials conducted in the 1950's and its widespread use was followed by a reduction in the incidence of the disease to a low level, but not its elimination. This failure to eliminate the disease was shown by epidemiological and laboratory studies to be due partly to deficiencies in the vaccines in current use, and possible partly to changes in the prevalent strains of *Bordetella pertussis*. New improved vaccines have been introduced and continuing PHLS surveillance studies have shown that these appear to be very effective; studies are also in progress to study the complications of pertussis vaccination.

Poliomyelitis has almost completely disappeared from Britain following the wide use of vaccination, but there is a continuing need to investigate all suspected cases in order to assess their origin, and in particular to determine whether any can be due to the vaccine virus. Over the last twelve years the Epidemiological Research Laboratory has studied all cases suspected of poliomyelitis and concluded that cases of poliomyelitis in recently vaccinated persons or their contacts occur rarely—approximately only 0.7 cases/million doses of vaccine given.

The laboratory has also had a continuing responsibility to monitor the efficacy of BCG vaccine and a further set of examinations on 1,585 children in 1972-73 showed that the current vaccines continue to give good tuberculin conversion, all but one of fifteen batches giving a 97% conversion or better and the one remaining giving a 92% conversion rate.

ANTIBIOTIC RESISTANCE IN BACTERIA

For many years the Enteric Reference Laboratory has been an active centre for the examination of antibiotic resistance in enterobacteria from man and animals; not only does it examine, for their resistance pattern, all the salmonellas received at Colindale, but it also determines the extent to which this resistance is carried in plasmids transferable from one strain, or even one bacterial genus, to another. In 1973 particular studies were made of the chloramphenicol-resistant *Salmonella typhi* from Mexico, where there has been a very large epidemic due to such strains, and from the Far East. It has become clear that large epidemics, whether of typhoid fever in man in Mexico or of salmonellosis in cattle in Britain, can be due entirely to a single clone—the progeny of a single bacterial cell.

The Cross-Infection Reference Laboratory has a continuing study of the staphylococci from septic lesions in patients in 7 London hospitals. This has shown a decline in the proportion of strains resistant to many antibiotics and a general decline in the proportion of tetracycline-resistant strains; the proportion of methicillin-resistant strains has declined somewhat since 1968.

The Food Hygiene Laboratory has surveyed the antibiotic resistance patterns of food-poisoning bacteria from English, Dutch and Danish frozen chickens to see whether any differences could be related to the differing use of antibiotics in feedstuffs.

QUALITY CONTROL

The need for regular assessment by medical diagnostic laboratories of their proficiency is now generally recognized. The PHLS set up a Quality Control Committee in December 1970. This Committee (p.40) has been greatly assisted by three members from outside the PHLS, Dr. E. Joan Stokes, Dr. C. L. Greenbury, and Dr. A. C. Scott and it has profited from the pilot studies conducted by Dr. Stokes with Dr. J. L. Whitby, with support from the DHSS.

In the period May 1971 to December 1973 the Committee was responsible for distributing 86 test specimens to all PHLS laboratories and to 26 hospital laboratories in England and Wales, Scotland and Northern Ireland. Most of the specimens were simulated clinical or sanitary material—faeces, throat swabs, skin scrapings, sera or water—and the microbes have included a great variety of pathogenic bacteria as well as fungi and viruses for identification and where appropriate antibiotic sensitivity testing. Sera have been issued for antibody tests and for antibiotic assays. In addition a few pure cultures of bacteria have been circulated as a check on individual identification test methods. The experience gained from these studies so far has done more to establish appropriate methods for the circulation of specimens and for analysis of the results, than to provide a strict measure of the microbiological competence of the laboratories, but forms an essential basis for a more extensive quality control service.

As in other quality control schemes the principle of anonymity has been accepted, it being considered that the most important objective of any such scheme being to stimulate self-criticism by the laboratories themselves.

Hitherto the preparation and despatch of the specimens has been undertaken by members of the Committee and others, and the analysis of results has been carried out, for some specimens in the Epidemiological Research Laboratory and for others by Dr. E. Joan Stokes of University College Hospital with the help of Mrs. J. N. Blair at the Queen Elizabeth Hospital, Birmingham.

Since the close of 1973, the PHLS Board has appointed Dr. P. B. Crone as Director of a Quality Control Laboratory which is being established in a laboratory at Neasden Hospital, Brentfield Road, London, NW10, and it is hoped that by the end of 1974 the laboratory will be able to make test specimens available to all hospital laboratories in the United Kingdom that wish to participate.

Comparative tests of laboratory performance have been in progress in some specialist areas outside the scope of the main Quality Control Committee. The Cross-Infection Reference Laboratory has, for many years, organised periodic comparisons of the results obtained in staphylococcus phage typing, not only in Britain but also in national typing laboratories overseas. The Food Hygiene Laboratory has been engaged in an international comparison of methods for isolating salmonellas from food. And in connection with the influenza surveillance studies mentioned above, the Standards Laboratory organised a comparative test of serological methods.

‘ Proficiency testing ’ is only one aspect of the general problem of laboratory quality control and the PHLS Committee’s terms of reference included the testing of laboratory materials and reagents. In the event it has not been feasible to arrange such testing through the Committee. However, a joint research project in which the Cross-Infection Reference Laboratory is collaborating with Dr. R. Blowers at the MRC Clinical Research Centre, Northwick Park, has gained valuable information on methods for examining antibiotic-sensitivity testing material. And for some years, the reference laboratories have carried out some monitoring of commercially produced diagnostic reagents. Most of this has been done in the Standards Laboratory at Colindale, which examines a range of antisera and suspensions, but the Venereal Diseases Reference Laboratory regularly examines the reagents sold for serological tests for syphilis, and found 27 of 51 batches to be unsatisfactory during 1973. Adequate culture media are a necessity for any bacteriological laboratory and the Media Department Manager at Colindale has devised a very comprehensive set of tests for monitoring all the material produced there.

RESEARCH AND DEVELOPMENT

The PHLS has a clear commitment to research and development over a wide field of microbiology and microbial disease, and the scope of this research is well reflected in the titles of the papers published by members of the Service during 1973 and listed at the end of this Report.

Virus infections. Influenza has already been mentioned as a disease of major epidemiological importance and the surveillance studies, which are still in the development rather than the routine stage, have been described. The Epidemiological Research Laboratory has also several studies in progress of the efficacy of influenza vaccines, for individual protection and for reducing industrial sick absence rates; into the persistence of antibody after vaccination, and into adverse reactions. The Virus Reference Laboratory, besides involvement in the field studies, is investigating the antigenic structure of influenza viruses.

Hepatitis associated with HB Ag (Australia antigen), which is a serious hazard in haemodialysis units, has provoked both a great deal of routine work (about 123,000 sera were examined for the HB Ag in PHLS laboratories in 1973) and also much research. The Virus Reference Laboratory is studying the properties of the antigen itself and trying to establish infection in marmosets. The Standards Laboratory is monitoring the reagents used by the Blood Transfusion Service. The Liverpool laboratory has studied subtyping of the antigen and the distribution of the subtypes, while workers in Exeter and Birmingham have been looking at ways in which the virus could spread in dialysis units. Surprisingly they find that it is very difficult to produce aerosols from blood, so that airborne spread from spilt blood seems unlikely. However, they find that particles of the size of the HB Ag can pass through haemodialysis membranes in both directions.

Bacterial infections. Hospital infection in its various aspects naturally continues to generate many studies. The Cross-Infection Reference Laboratory has been working for some years in the new hospital at Greenwich, which is totally mechanically ventilated. After devising methods for studying the aerial spread of gases, inert particles and staphyloccoci from patients and staff, the workers measured the effectiveness of the ward design for preventing spread from one room to another. They found that the staphylococci dispersed into the air of one room spread to other rooms in greater numbers than could be accounted for by the movements of air, and suggested that transient carriage on clothing might provide and explanation for this observation. The laboratory has also been studying the effectiveness of laminar (uni-directional) air-flow systems for patient isolation and have also used the special facilities devised for these tests to study the effectiveness of various sorts of protective clothing. These studies and the recent recognition of the potential hazards of hexachlorophane skin disinfection in infants have stimulated work on the normal bacterial flora of the skin.

There are indications of a rise in the last two years in the incidence of meningococcal meningitis and there are known to be interesting differences in the serotype distributions between, for example, Britain and the USA, as well as important differences in the prevalence of sulphonamide-resistant strains. The Manchester laboratory has been studying the epidemiology of the disease and the use of counter-current immunoelectrophoresis of CSF for diagnosis; the Ipswich laboratory has studied the frequency of meningococcal carriers in normal people, and found at one point a rate of 71 per cent in a naval school, in the absence of any disease; and the Standards Laboratory, in addition to typing nearly 900 strains of meningococci, has been developing tests for demonstrating antibody production for use in diagnosis, and has been exploring a phage-typing system.

Studies in the pathogenesis of gonococcal infections are in progress in Birmingham (in collaboration with the University Department of Microbiology) and attempts are being made to isolate and characterize the antigens of the gonococcus at Oxford. Several laboratories are testing the use of immunofluorescence for diagnosis, and several are also keeping a watch on the prevalence of penicillin-resistant strains.

The bacteriological examination of urine constitutes a large part of the workload of many laboratories and the epidemiology of urinary tract infection deserves continuing research. A computer-assisted study at Plymouth has emphasized the differences in the bacteria responsible for infection in different population groups. In particular, strains of Micrococcus (distinguished from *Staphylococcus epidermidis* by novobiocin resistance) were almost confined to, and were the second most common pathogens in, the urine of women between the ages of 15 and 34 seen with urinary tract infection in general practice. The importance of micrococci in urinary infection has also been demonstrated in collaborative studies with general practitioners at Portsmouth, while the epidemiology of the infection in infants or school children is being investigated at Leeds, Manchester and Oxford. The Dorchester and Central Middlesex laboratories are looking at methods for transporting urine specimens for examination.

Brucella abortus has long been recognized as an important pathogen, causing acute and chronic disease, but there is still considerable controversy on the significance of the various diagnostic tests. The Epidemiological Research Laboratory and the Standards Laboratory are conducting a prospective study in veterinary students in the hope of elucidating some of the problems, while the Worcester Laboratory, in collaboration with a local physician, has been carrying out a careful clinical assessment of veterinarians in the area, most of whom have some laboratory evidence of long-standing infection, but often without any history of disease.

The non-sporing anaerobic bacteria especially *Bacteroides*, have, on the other hand, gained a new reputation as pathogens in the last few years and studies at Portsmouth, demonstrating the importance of these bacteria as pathogens in the female genital tract, have shown that there appears to be a special risk of their producing infection after gynaecological operations performed during the first part of the menstrual cycle.

Microbes in non-infective diseases. An area of growing interest is the part played by microbes in causing apparently non-infective diseases. Several are being studied in PHLS laboratories.

Both mycoplasmas and chlamydias have been considered as possibly related to female infertility. The Bristol Laboratory has an extensive programme on the epidemiology and serology of chlamydia including their relation to infertility. Genital mycoplasmas have been studied at Bristol, Taunton and Newport as well as by the Mycoplasma Reference Laboratory and the Epidemiological Research Laboratory.

The recognition of rubella infection in pregnant women as a cause of congenital defect, and the more recent availability of rubella vaccination have generated a heavy workload in the screening of sera from pregnant women and in serological tests prior to vaccination; PHLS laboratories examined nearly a quarter of a million sera for rubella antibodies in 1973. The examination of sera from pregnant women suspected of having had an attack of rubella commonly presents the problem of whether antibodies found derive from a recent, and so potentially teratogenic, infection, or an earlier and so harmless one. The distinction is attempted by examining the sera for the proportion of antibody in the various immunoglobulin fractions. The Manchester Laboratory has carried out an extensive study of the various methods available: ultracentrifugation, gel filtration and immunofluorescent staining, in which infected tissue culture cells are exposed first to the test serum, and then to fluorescein-coupled antisera specific for the different immunoglobulin fractions. In acute rubella all classes of antibody, IgG, IgM, and IgA start to increase within three days of the appearance of the rash; IgG reaches a maximum in two weeks but persists thereafter; IgM reaches a peak in the second week but is not usually detectable after one month from onset of rash, and IgA behaves rather similarly to IgM. Both the last two can therefore indicate recent rubella infection. In acute rubella antibodies detectable by immunofluorescence also appear in nasal secretions and there are indications that the IgA is locally produced in the nasal mucosa. Studies on various methods for separating immunoglobulins are also in progress at Bristol, Leeds, Liverpool and Portsmouth.

Infections with cytomegalovirus in pregnancy have been implicated in the causation of mental defect and the Manchester Laboratory has a substantial programme using the fluorescent antibody technique to assess the pregnancies that may be at risk, and both the Manchester and the Virus Reference Laboratories are studying the prevalence of cytomegalovirus in infants and its relation to disease in the central nervous system.

Juvenile diabetes has been shown to have a significant seasonal variation in time of onset and exploration of various viral infections at the Epsom Laboratory have pointed to a link between infection with Coxsackie virus B4 and this form of diabetes: children examined soon after diagnosis have a raised titre to this virus significantly more often than controls. Moreover, mice infected experimentally with Coxsackie virus have been found to develop a diabetes-like illness.

The Virus Reference Laboratory has a number of studies of virus infections associated with cancers in man or animals and of the virus infections seen in patients on immuno-suppressive treatment.

The idea that products of bacterial metabolism may be carcinogenic is relatively new, but is at present the principal topic of study in the new Bacterial Metabolism Research Unit, whose staff were previously working in this field with Professor Williams at St. Mary's Hospital Medical School. Carcinoma of the colon is one of the commonest forms of cancer in Britain, but is very rare in many parts of the world. The hypothesis now under test is that gut bacteria, especially *Bacteroides* and *Clostridium paraputrificum* may convert bile steroids into carcinogens. Observations made during the last two years revealed that patients with colon cancer tend to have higher concentrations of bile steroids and a larger number of *Cl. paraputrificum* in faeces than ' controls ' without colon cancer, and preparations are being made to set up a prospective study to seek evidence for a causal relationship.

Other carcinogens that may be produced by bacteria are nitrosamines: bacteria can nitrosate secondary amines at physiological pH and it may be that in districts where drinking water or vegetables contain especially high concentrates of nitrates, bacteria in the urinary tract, or in the stomach of persons with achlorhydria, might produce carcinogenic nitrosamines. These and other possible metabolic pathways leading to potential carcinogenic agents are being studied with the assistance of a generous grant from the Cancer Research Campaign.

LABORATORIES

The Area Public Health Laboratory, County Hall, London moved to new accommodation at Dulwich Hospital on 19 February 1973.

The Regional Public Health Laboratory, Cambridge moved to accommodation at the new Addenbrooke's Hospital on 5 May 1973.

The Leptospirosis Reference Laboratory moved from the London School of Hygiene and Tropical Medicine on 25 September 1973 to a new laboratory building in the grounds of Colindale Hospital shared with the Bacterial Metabolism Research Laboratory, newly established under the direction of Professor R. E. O. Williams.

The Public Health Laboratory Service Board withdrew from the following Area Public Health Laboratories during 1973: Bedford, Northampton, Sunderland and Wakefield. The Board continues to administer the Sunderland Laboratory on an agency basis for the Northern Regional Health Authority. The Epidemiological Research Unit at Cirencester was closed on the retirement of the Honorary Director, Dr. R. E. Hope-Simpson.

HEADQUARTERS OFFICE

The Headquarters Office moved to a new building in the grounds of Colindale Hospital on 13 September 1973.

DEATHS

It is with great regret that we have to report the death on 8 February 1973 of Dr. P. W. W. Griffiths, Consultant Microbiologist Deputy Director of the Area Public Health Laboratory, Conway, and in charge of the Sub-Laboratory at the Royal Alexandra Hospital, Rhyl since 1961; and the death on 4 April 1973 of Mr. N. W. Emberley, Head Technician at the Area Public Health Laboratory, Brighton, and a member of the Service since 1939.

RETIREMENTS

During 1973 three senior members of the staff retired after long and valued service: Dr. J. E. Jameson, Director of the Area Public Health Laboratory, Brighton, a member of the Service since 1948; Dr. W. F. Lane, Director of the Area Public Health Laboratory, Bedford, a member of the Service since 1948; and Dr. H. G. M. Smith, Director of the Area Public Health Laboratory, Bradford, a member of the Service since 1947. Dr. R. E. Hope-Simpson, Honorary Director of the Epidemiological Research Unit, Cirencester, also retired in 1973.

TRANSFERS

In November 1973 Dr. B. T. Thom, Director of the Area Public Health Laboratory, Whipps Cross Hospital, London, was transferred to succeed Dr. J. E. Jameson as Director of the Area Public Health Laboratory, Brighton. On the closure of the Area Public Health Laboratory, Wakefield in December 1973, Dr. L. A. Little transferred to the Regional Public Health Laboratory, Leeds. Dr. P. B. Crone, Director of the Area Public Health Laboratory, Sunderland, transferred temporarily to the Regional Public Health Laboratory, Newcastle, before assuming early in 1974 the Directorship of the Microbiology Quality Control Laboratory.

NEW APPOINTMENTS

The following Consultant appointments were made during 1973: Dr. Evelyn M. Finnie, Consultant Microbiologist at the Area Public Health Laboratory, Coventry; Dr. N. J. Mitchell, Consultant Microbiologist Deputy Director at the Area Public Health Laboratory, Shrewsbury; Dr. Helen G. Ross, Consultant Microbiologist to the Medway & Gravesend and Maidstone & District Hospital Groups, in association with the Area Public Health Laboratory, Maidstone; and Dr. G. Scrimgeour, Consultant Microbiologist and later Director of the Sunderland Laboratory.

LOCUMS

We are most grateful to Dr. Bessie H.E. Cadness Graves, Dr. R. Norton and Dr. D. A. Skan for help with locum duties during 1973.

PUBLICATIONS BY MEMBERS OF THE STAFF OF THE PUBLIC HEALTH LABORATORY SERVICE DURING 1973

Besides the specific items mentioned below, there are many publications to which the work of the Service has contributed. The internationally recognised reference laboratories and the Epidemiological Research Laboratory submit figures regularly to W.H.O. for inclusion in their statistical periodicals. Again, the giving of specialist help and advice and the supply of serological reagents are among the functions of the Service, and in the course of the year a number of papers have acknowledged such contributory work by members of the staff. Other unlisted material includes leading articles, unsigned annotations, conference papers which remain unpublished, book reviews, contributions to the various abstracting journals, and notes compiled from the Services's weekly Communicable Disease Report which appear regularly in the Brit. med. J. *and elsewhere.*

ABBOTT, J. D. Meningococcal infection: serotypes and sulphonamide sensitivity. (Abstract) *J. clin. Path.*, 1972, **25,** 1009.

ALLAM, N. M., POWELL, D. G., ANDREWS, B. E. and LEMCKE, R. M. The isolation of mycoplasma species from horses. (Letter) *Vet. Rec.*, 1973, **93,** 402.

ALMEIDA, June D. and HOYLE, L. The reaggregation of influenza virus sub-units produced by detergent treatment of virus particles. *Micron*, 1972, **3,** 306.

ANDERSON, E. S. Chloramphenicol-resistant *Salmonella typhi*. (Letter) *Lancet*, 1973, ii, 1494.

ANDERSON, E. S. Ecological observations on R factors. *Abstr. I int. Congr. Bact., Jerusalem. 1973*, 1973, **1**, 193.

ANDERSON, E. S. Ecological observations on R factors. *Abstr. VIII int. Congr. Chemother., Athens, 1973*, 1973, Vol. **C**, Abstr. No. A vii-1.

ANDERSON, E. S. The ecology of *Salmonella typhimurium* infection. *Acta microbiol. hellen.*, 1973, **18,** 200.

ANDERSON, E. S. Suggested adoption of a non-motile variant of strain Ty2 for vaccination against typhoid fever. *Progr. immunobiol. Standard.*, 1972, **5,** 373.

ANDERSON, E. S. and HOBBS, B. C. Studies of the strain of *Salmonella typhi* responsible for the Aberdeen typhoid outbreak. *Israel J. med. Sci.*, 1973, **9,** 162.

ANDERSON, E. S., THRELFALL, E. J., CARR, J. M. and SAVOY, L. G. Bacteriophage restriction in *Salmonella typhimurium* by R factors and transfer factors. *J. Hyg., Camb.*, 1973, **71,** 619.

ANDREWS, B. E. and HEWISH, R. A. Observations on simple cultural and biochemical characterization of mycoplasmas. *Proc. I Conf. Taxon. Physiol. Mycoplasmas, Brno*, 1970 In: *In vitro v ČSSR*, 1973, 2/1, p.25.

ANDREWS, B. E., LEACH, R. H., GOURLAY, R. N. and HOWARD, C. J. Enhanced isolation of *Mycoplasma dispar* by substitution of ampicillin for benzylpenicillin in growth media. *Vet. Rec.*, 1973, **93,** 603.

APPLETON, Hazel The use of marmosets in the study of infectious hepatitis. *University of London, Ph.D. Thesis*, 1973

ASSCHER, A. W., MCLACHLAN, M. S. F., JONES, R. V., MELLER, S., SUSSMAN, M., HARRISON, S., JOHNSTON, H. H., SLEIGHT, G. and FLETCHER, E. W. Screening for asymptomatic urinary-tract infection in schoolgirls: a two-centre feasibility study. *Lancet*, 1973, ii, 1.

Barker, J., Healing, D. and Hutchison, J. G. P. Characteristics of some co-trimoxazole-resistant *Enterobacteriaceae* from infected patients. *J. clin. Path.*, 1972, **25**, 1086.

Barnard, D. L., Hart, J. C. D., Marmion, V. J. and Clarke, S. K. R. Outbreak in Bristol of conjunctivitis caused by adenovirus type 8, and its epidemiology and control. *Brit. med. J.*, 1973, ii, 165.

Barrow, G. I. The environmental significance of *Vibrio parahaemolyticus* and other marine vibrios. *VI int. Symp. World Ass. vet. Food-Hygienists, Elsinore' 1973*, 1973, Paper No. 11.

Barrow, G. I. Marine micro-organisms and food poisoning. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p. 181.

Barrow, G. I. *Studies on Vibrio parahaemolyticus. Abstr. I. int. Congr. Bact., Jerusalem, 1973*, 1973, **2**, 120.

Bascomb, Shoshana, Lapage, S. P., Curtis, M. A. and Willcox, W. R. Identification of bacteria by computer: identification of reference strains. *J. gen. Microbiol.*, 1973, **77**, 291.

Bennett, F. J., Barnicot, N. A., Woodburn, J. C., Pereira, M. S. and Henderson, B. E. Studies on viral, bacterial, rickettsial and treponemal diseases in the Hadza of Tanzania, and a note on injuries. *Hum. Biol.*, 1973, **45**, 243.

Berrill, W. T., Maskell, R. M., Pead, L. and Polak, A. Treatment of pseudomonas urinary infections with oral carbenicillin. *Brit. J. Urol.*, 1973, **45**, 563.

Berrill, W. T., Maskell, R. M., Pead, L. and Polak, A. Treatment of pseudomonas urinary infections with oral carbenicillin, and a pharmacokinetic study in patients with renal failure. (Abstract) In: *Indanyl carbenicillin: proceedings of a symposium, London, 1973*, edited by H. Swarz & F. E. Storari. Amsterdam, Excerpta Medica (for Pfizer Europe), 1973, p.74.

Bhattacharyya, M. N., Jephcott, A. E. and Morton, R. S. Diagnosis of gonorrhoea in women, comparison of sampling sites. *Brit. med. J.*, 1973, ii. 748.

Bissell, P. S. and Thomas, K. L. Sensitivity testing. (Letter) *Gaz. Inst. med. Lab. Tech.*, 1973, **17**, 42.

Blowers, R., Stokes, E. J. and Abbott, J. D. Antibiotic-sensitivity tests. (Letter) *Brit. med. J.*, 1973, iii, 46.

Bradstreet, C. M. Patricia, Pereira, M. S. and Pollock, T. M. The organization of a national virological diagnostic service. *Progr. med. Virol.*, 1973, **16**, 241.

Brahms, J., Pilet, J., Tran, T. P. L. and Hill, L. R. Direct evidence of the C-like form of sodium deoxyribonucleate. *Proc. nat. Acad. Sci., Wash.*, 1973, **70**, 3352.

Brennan, J. L. and Morris, C. A. A case of brucella arthritis in the wrist. (Abstract) *J. clin. Path.*, 1972, **25**, 1002.

Bullen, Catherine L., Willis, A. T. and Williams, K. The significance of bifidobacteria in the intestinal tract of infants. In: *Actinomycetales: characteristics and practical importance*, edited by G. Sykes & F. A. Skinner. London, Academic Press, 1973. (Soc. appl. Bact. Symp. Ser. No. 2) p.311.

Cartwright, R. Y. Clotrimazole in the treatment of acute vaginal candidiasis. *Abstr. VIII int. Congr. Chemother., Athens, 1973*, 1973, Vol. **A**, Abstr. No. A-426.

Cartwright, R. Y. and Clifford, C. M. Pharaoh's ants. (Letter) *Lancet*, 1973, ii. 1455.

Cavanagh, P., Bennett, J. C., Kampfner, G., Khan, M. S. and Noble, R. Outbreak of influenza in a partly-vaccinated boarding school population. *Community Med.*, 1973, **129**, 298.

Chessum, B. S. [Streptococcal grouping.] (Letter) *Med. Lab. Tech.*, 1973, **30**, 193.

Chester, I. R., Meadow, P. M. and Pitt, T. L. The relationship between the O-antigenic lipopolysaccharides and serological specificity in strains of *Pseudomonas aeruginosa* of different O-serotypes. *J. gen. Microbiol.*, 1973, **78**, 305.

Clarke, Suzanne K. R. Parainfluenza virus infections. *Postgrad. med. J.*, 1973, **49**, 792.

Clarke, Suzanne K. R., Hart, J. C. D. and Barnard, D. L. The disinfection of instruments and hands during outbreaks of epidemic keratoconjunctivitis. *Trans. ophthal. Soc. U.K.*, 1972, **92,** 613.

Coleman, D. V., Field, A. M., Gardner, S. D., Porter, K. A. and Starzl, T. E. Virus-induced obstruction of the ureteric and cystic duct in allograft recipients. *Transplant. Proc.*, 1973, **5,** 95.

Coleman, D. V., Gardner, S. D. and Field, A. M. Human polyomavirus infection in renal allograft recipients. *Brit. med. J.*, 1973, iii, 371.

Coleman, T. J., Gamble, D. R. and Taylor, K. W. Diabetes in mice after Coxsackie B4 virus infection. *Brit. med. J.*, 1973, iii, 25.

Collins, C. H. and Lyne, P. M. Plastic drinking straws as disposable pipettes. (Letter) *Gaz. Inst. med. Lab. Tech.*, 1973, **17,** 195.

Cossart, Yvonne E. Australia antigen and hepatitis. *Publ. Hlth, Lond.*, 1972, **87,** 33.

Cossart, Yvonne E. [Contributions to discussion]. In: *Intrauterine infections*, edited by K. Elliott & J. Knight. Amsterdam, Associated Scientific Publishers, 1973. (CIBA Foundation Symposium 10 N.S.)

Cossart, Yvonne, E., Boxall, E. and Flewett, T. H. False-negative radioimmunoassay tests for Australia antigen. (Letter) *Lancet*, 1973, ii, 1333.

Cradock-Watson, J. E., Ridehalgh, M. K. S., Bourne, M. S. and Vandervelde E. M. Nasal immunoglobulin responses in acute rubella determined by the immunofluorescent technique. *J. Hyg., Camb.*, 1973, **71,** 603.

Craske, J. Serum hepatitis and Australia antigen. *NATNews*, 1973, **10,** No. 1, 14.

Dadswell J. V. Acute appendicitis and salmonella infections. (Letter) *Brit. med. J.*, 1973, i, 740.

Dadswell, J. V. and Price, D. G. Floor bacteria in an intensive-care unit. (Letter) *Lancet*, 1973, ii, 1037.

Davies, P. D., Fleck, D. G. and Rahi, A. H. S. Status of *Toxoplasma gondii* in the aetiology of senile human cataract. *Brit. J. Ophthal.*, 1973, **57,** 717.

Davies, P. D., Fleck, D. G. and Rahi, A. H. S. The status of *Toxoplasma gondii* in the etiology of senile human cataract. (Abstract) *Proc. R. Soc. Med.*, 1973, **66,** 169.

de Silva, L. M., Khan, M. S., Kampfner, G. and Tobin, J. O'H. The post-mortem diagnosis of influenzal infection by fluorescent IgG, IgA and IgM antibody studies on necropsy blood. *J. Hyg., Camb.*, 1973, **71,** 107.

de Silva, L. M. and Tobin, J. O'H. The post-mortem diagnosis of influenzal infection by IgG, IgA and IgM antibody estimations. (Abstract) *J. Med. Microbiol.*, 1973, **6,** Pxv.

Dhar, S. K. and Johnson, R. The oxidase activity of *Chromobacterium.* *J. clin. Path.*, 1973, **26,** 304.

Dugdale, J. B. Storage of blood for Australia-antigen tests. (Letter) *Lancet*, 1973, i, 211.

Dunn, G. F. N. and Wormald, P. J. Influenza-A Hong Kong vaccine and the new variant A/Eng/42/72. (Letter) *Lancet*, 1973, i, 95.

Dymock, I. W., Woolf, I. L., Boyes, B. E., Whittaker, J. S., Tapp, E., Jones, D. M., Renton, P. H., Stratton, F. and McSween, R. Liver disease in asymptomatic hepatitis B antigen carriers. (Abstract) *Quart. J. Med.*, 1973, **42,** 831.

Edward, D. G. ff. Decisions of the Subcommittee on Taxonomy of the Mycoplasmatales—Mexico 1970. *Proc. I Conf. Taxon. Physiol. Mycoplasmas, Brno, 1970.* In: *In vitro v ČSSR*, 1973, 2/1, p.43.

Edward, D. G. ff. and Freundt, E. A. Type strains of species of the order Mycoplasmatales, including designation of neotypes for *Mycoplasma mycoides* subsp. *mycoides*, *Mycoplasma agalactiae* subsp. *agalactiae*, and *Mycoplasma arthritidis.* *Int. J. syst. Bact.*, 1973, **23,** 55.

Edward, D. G. ff. and Moore, W. B. Determination of utilization of glucose by mycoplasmas. *Proc. II Conf. Taxon. Physiol. Mycoplasmas, Brno, 1972.* In: *In vitro v ČSSR*, 1973, 2/1, p.148.

Edwards, Joan M. Infectious mononucleosis: virological aspects. (Abstract) *J. clin. Path.*, 1973, **26,** 987.

Elek, S. D., Davies, J. R. and Miles, R. Resistotyping of *Shigella sonnei.* *J. med. Microbiol.*, 1973, **6,** 329.

Elkan, E. and Philpot, C. M. Mycotic infections in frogs due to a phialophora-like fungus. *Sabouraudia*, 1973, **11,** 99.

Ernø, H., Jurmanová, K. and Leach, R. H. Bovine mycoplasmas: a serological study by the metabolic inhibition test. *Acta vet. scand.*, 1973, **14,** 511.

Farrell, I. D. and Robertson, L. A comparison of various selective media, including a new selective medium, for the isolation of brucellae from milk. *J. appl. Bact.*, 1972, **35,** 625.

Fell, H. W. K., Nagington, J., Naylor, G. R. E. and Olds, R. J. Infections in man with *Corynebacterium haemolyticum.* (Abstract) *J. med. Microbiol.*, 1973, **6,** Pvii.

Fennell, H. Substitution of Teepol for sodium ricinoleate in modified Schubert's medium. (Letter) *Wat. Treatm. Exam.*, 1973, **22,** 231.

Fleck, D. G. The problem of congenital toxoplasmosis. In: *Intrauterine infections*, edited by K. Elliott & J. Knight. Amsterdam, Associated Scientific Publishers, 1973. (CIBA Foundation Symposium 10 N.S.) p.45, also contributions to discussion.

Fletcher, S. M. and Rondle, C. J. M. *Micropolyspora faeni* and farmer's lung disease. *J. Hyg., Camb.*, 1973, **71,** 185.

Flewett, T. H. The rapid diagnosis of herpes encephalitis. *Postgrad. med. J.*, 1973, **49,** 398.

Flewett, T. H., Bryden, A. S. and Davies, H. Virus particles in gastroenteritis. (Letter) *Lancet*, 1973, ii, 1497.

Foord, N. Use of gas and particle tracers in the study of infection transmission. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands*, 1972, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.450.

Foord, N. Ventilation rates and air pressure differences in isolation rooms. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands*, 1972, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.510.

Fraser, P. K., Bailey, G. K., Abbott, J. D., Gill, J. B. and Walker, D. J. C. The meningococcal carrier-rate. *Lancet*, 1973, i, 1235.

Freeman, R., King, B. and Hambling, M. H. Infection with *Mycoplasma pneumoniae* after open-heart surgery. *J. thorac. cardiovasc. Surg.*, 1973, **66,** 642.

Freeman, R., King, B. and Hambling, M. H. Infective complications of open-heart surgery and the monitoring of infections by the NBT test. *Thorax*, 1973, **28,** 617.

Freundt, E. A., Andrews, B. E., Ernø, H., Kunze, M. and Black, F. T. The sensitivity of Mycoplasmatales to sodium-polyanethol-sulfonate and digitonin. *Zbl. Bakt., I Abt. Orig., A*, 1973, **225,** 104.

Gamble, D. R. and Taylor, K. W. Coxsackie B virus and diabetes. (Letter) *Brit. med. J.*, 1973, i. 289.

Gamble, D. R., Taylor, K. W. and Cumming, H. Coxsackie viruses and diabetes mellitus. *Brit. med. J.*, 1973, iv, 260.

Gardner, Sylvia D. Prevalence in England of antibody to human polyomavirus (B.K.) *Brit. med. J.*, 1973, i, 77.

Gardner, Sylvia D. and Field, A. M. Human papova viruses. (Letter) *Nature, Lond.*, 1973, **243,** 250.

Gibson, G. L. Bacteriological hazards of disposable bedpan systems. *J. clin. Path.*, 1973, **26,** 146.

Gibson, G. L. A disposable bedpan system using an improved disposal unit and self-supporting bedpans. *J. clin. Path.*, 1973, **26,** 925.

Gilbert, R. J. and Wieneke, A. A. Staphylococcal food poisoning, with special reference to the detection of enterotoxin in food. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p.273.

Gill, J. B., Fraser, P. K. and Smith, J. W. G. Influenza vaccination in a training establishment. *J. R. nav. med. Serv.*, 1973, **59,** 56.

Gillespie, E. H. Ethylene oxide gas sterilisation. *Hlth. soc. Serv. J.*, 1973, Suppl. (Cent, steril. Club XV annu. Meet., Reading, 1973) p.9.

Gilmore, O. J. A., Martin, T. D. M. and Fletcher, B. N. Prevention of wound infection after appendicectomy. *Lancet*, 1973, i, 220.

Gray, R. D. and James, S. M. Occult diphtheria infection in a hospital for the mentally subnormal. *Lancet*, 1973, i, 1105.

Greves, P. W. Selectagerm: a new approach to clinical bacteriology. *J. clin. Path.*, 1973, **26,** 184.

Grindley, June N. The study of resistance transfer systems in *Escherichia coli* and salmonellae, with special regard to kanamycin resistance. *University of London, Ph.D. Thesis*, 1973.

Grindley, N. D. F., Grindley, J. N. and Anderson, E. S. R factor compatibility groups. *Molec. gen. Genet.*, 1972, **119,** 287.

Grindley, N. D. F., Grindley, J. N., Smith, H. R. and Anderson, E. S. Characterisation of derepressed mutants of an F-like R factor. *Molec. gen. Genet.*, 1973, **120,** 27.

Grindley, N. D. F., Humphreys, G. O. and Anderson, E. S. Molecular studies of R factor compatibility groups. *J. Bact.*, 1973, **115,** 387.

Gross, R. J., Rowe, B. and Easton, J. A. Neonatal meningitis caused by *Citrobacter koseri*. *J. clin. Path.*, 1973, **26,** 138.

Hale, J. H. and Codd, A. A. Antigen-induced depression of antigen-reactive cells in immunised mice. *J. med. Microbiol.*, 1973, **6,** 37.

Hambling, M. H. The devil's grip. (Letter) *Lancet*, 1973, i, 1505.

Harman, R. R. M., Nagington, J. and Rook, A. Virus infections. In: *Textbook of dermatology*, 2nd ed., edited by A. Rook, D. S. Wilkinson & F. J. G. Ebling. Oxford, Blackwell, 1972, **1,** 538.

Harris, D. and Morris, C. A. *Use of antibiotics in orthopaedic patients.* Oswestry, Robert Jones & Agnes Hunt Orthopaedic Hospital, 1973.

Hart, J. C. D., Barnard, D. L., Clarke, S. K. R. and Marmion, V. J. Epidemic keratoconjunctivitis: a virological and clinical study. *Trans. ophthal. Soc. U.K.*, 1972, **92,** 795.

Hart, R. J. C. The epidemiology of Q fever. *Postgrad. med. J.*, 1973, **49,** 535.

Hart, R. J. C. and Miller, D. L. Echovirus-17 infections in Britain 1969-71. *Lancet*, 1973, ii. 661.

Hart, R. J. C. and Shaw, D. B. Q-fever endocarditis. (Letter) *Brit. med. J.*, 1973, iii, 233.

Harvey, R. W. S. Salmonella contaminated animal feed in relation to infection in animals and man. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p.9.

Harvey, R. W. S. Salmonellosis. In: *University of Nottingham Nutrition Conference for Feed Manufacturers, 1971*, No. 5, edited by H. Swan & D. Lewis. Edinburgh, Churchill Livingstone, 1971, p.100.

Harvey, R. W. S. and Price, T. H. H phase change of *Salmonella thomson* at different temperatures. *J. Hyg., Camb.*, 1973, **71,** 55.

Harvey, R. W. S., Price, T. H. and Hall, M. L. M. Isolations of subgenus III salmonellas (arizonas) in Cardiff, 1959-1971. *J. Hyg., Camb.*, 1973, **71,** 481.

Henderson, R. J. Assignment report of health laboratory services in India. (WHO project: SEARO/0159. 1973, SEA/HLM/76.

Henderson, R. J. Assignment report of health laboratory services in Sri Lanka. (WHO project: SEARO/0159). 1973, SEA/HLM/70.

Henderson, R. J. Brucellosis. *Brit. J. Hosp. Med.*, 1973, **10**, 573.

Henderson, R. J. Brucellosis: the situation in Britain. *Hlth Trends*, 1973, **5**, 10.

Henderson, R. J. Subclinical brucellosis. (Letters) *Brit. med. J.*, 1973, ii, 306, and iii, 235.

Henderson, R. J. Summary of recent abstracts. VI. Plague. *Trop. Dis. Bull.*, 1973, **70**, 601.

Hewitt, M., Barrow, G. I., Miller, D. C., Turk, F. and Turk, S. Mites in the personal environment and their role in skin disorders. *Brit. J. Derm.*, 1973, **89**, 401.

Higgins, P. G. Rhinovirus infections. *Postgrad. med. J.*, 1973, **49**, 802.

Higgins, P. G. and Crow, K. D. Recurrent Kaposi's varicelliform eruption in Darier's disease. *Brit. J. Derm.*, 1973, **88**, 391.

Higgins, P. G. and Ellis, E. M. Further observations on the use of organ cultures in the study of acute respiratory-tract infections. *J. med. Microbiol.*, 1973, **6**, 177.

Higgins, P. G. and Scott, R. J. D. The isolation of enteroviruses from cases of acute conjunctivitis. *J. clin. Path.*, 1973, **26**, 706.

Hill, L. R. A fault in Pratt's critique of numerical taxonomy? *J. theor. Biol.*, 1973, **40**, 397.

Hill, L. R. Theoretical aspects of numerical identification. *Abstr. I int. Congr. Bact., Jerusalem, 1973*, 1973, **2**, 86.

Hill, L. R. and Andrews, B. E. Approaching mycoplasma taxonomy through correlation of characters. *Proc. I. Conf. Taxon. Physiol. Mycoplasmas, Brno, 1970*, In: *In vitro v ČSSR*, 1973, 2/1, p.35.

Hobbs, Betty C. Bacteriological content of food. *Community Hlth*, 1972, **3**, 287.

Hobbs, Betty C. *Clostridium perfringens* food poisoning. *Abstr. IV int. Conf. global Impacts appl. Microbiol., São Paulo, 1973*, 1973, p.7.

Hobbs, Betty C. Food-borne disease from raw foods, with special reference to *Vibrio parahaemolyticus*. *Abstr. I int. Congr. Bact., Jerusalem, 1973*, 1973, **1**, 137.

Hobbs, Betty C. Food-borne diseases in relation to tourism: the problem viewed from British experience. *VI int. Symp. World Ass. vet. Food-Hygienists, Elsinore, 1973*, 1973, Paper No. 2.

Hobbs, Betty C. Food poisoning in England and Wales. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p.129.

Hobbs, Betty C. Improved methods for salmonellae detection in foods. *Abstr. IV int. Conf. global Impacts appl. Microbiol., São Paulo, 1973*, 1973, p.12.

Hobbs, Betty C. Microbiological standards for foods. *Brit. Fd manuf. Ind. Res. Ass. tech. Circ.*, 1973, No. 534.

Hobbs, Betty C., Clifford, W., Ghosh, A. C., Gilbert, R. J., Kendall, M., Roberts, D. and Wieneke, A. A. Sampling of food and other material for bacteriological and ecological studies. In: *Sampling: microbiological monitoring of environments*, edited by R. G. Board & D. W. Lovelock. London, Academic Press, 1973. (Soc. appl. Bact. tech. Ser. No. 7) p.233.

Hollingdale, M. R. Antibody responses in patients with farmer's lung to antigens from *Micropolyspora faeni*. (Abstract) *J. gen. Microbiol.*, 1973, **77**, xvii.

Hone, Rosemary, Fitzpatrick, S., Keane, C., Gross, R. J. and Rowe, B. Infantile enteritis in Dublin caused by *Escherichia coli* 0142. *J. med. Microbiol.*, 1973, **6**, 505.

Hope-Simpson, R. E. and Miller, D. L. The definition of acute respiratory illnesses in general practice. *Postgrad. med. J.*, 1973, **49**, 763.

Hopkins, G. B., Gostling, J. V. T., Hill, I., McNab, D. J. N., Mullan, D. P., Scutt, R. W.B. and Wright, E. A. Hepatitis after tattooing: a fatal case. *Brit. med. J.*, 1973, iii, 210.

Hoskins, T. W., Davies, J. R., Allchin, A., Miller, C. L. and Pollock, T. M. Controlled trial of inactivated influenza vaccine containing the A/Hong Kong strain during an outbreak of influenza due to the A/England/42/72 strain. *Lancet*, 1973, ii. 116.

Howells, C. H. L. Bottle leakage and autoclave design. (Letter) *Pharm. J.*, 1973, **211,** 371.

Howells, C. H. L., Evans, A. D. and Vesselinova-Jenkins, C. Effect of two doses of influenza vaccine in stimulating antibody in volunteers. *Lancet*, 1973, i, 1436.

Howie, *Sir* James [Contribution to discussion on] the unity of medicine—the view of the community physician. *Publ. Hlth, Lond.*, 1972, **86,** 320.

Howie, *Sir* James Infectious-disease units. (Letter) *Lancet*, 1973, i, 1504.

Howie, *Sir* James Medical microbiology for patient and community. *J. clin. Path.*, 1972, **25,** 921.

Howie, *Sir* James Organization of conferences. (Letter) *Brit. med. J.*, 1973, i. 611.

Howie, *Sir* James Professing Microbiology at Glasgow in the 1950's. *Coll. Courant*, 1973, **25,** 26.

Howie, *Sir* James Sterilization of discarded cultures. (Letter) *J. appl. Bact.*, 1973, **36,** No. 4, i.

Hoyle, L. and Barker, S. M. Fractionation of the influenza virus with the object of producing subunit vaccine. *Postgrad. med. J.*, 1973, **49,** 193.

Huddy, R. B., Jones, D. M. and Lee, H. Y. Tetracycline and co-trimoxazole in acute exacerbations of chronic bronchitis. *Brit. J. Dis. Chest*, 1973, **67,** 241.

Hughes, M. H. Anthrax. (Letter) *Brit. med. J.*, 1973, i. 488.

Hughes, M. H. Library services in hospitals. (Letter) *Brit. med. J.*, 1973, iv, 425.

Jenkins, P. A. and Marks, J. Thin-layer chromatography of mycobacterial lipids as an aid to classification. *Ann. Soc. belge Méd. trop.*, 1973, **53,** 331.

Jephcott, A. E. Preliminary study of colony type stability of *Neisseria gonorrhoeae* in liquid culture. *Brit. J. vener. Dis.*, 1972, **48,** 369.

Jephcott, A. E., Lowbury, E. J. L. and Richmond, M. H. Non-transferable carbenicillin resistance of *Pseudomonas aeruginosa* from a burn. (Letter) *Lancet*, 1973, i, 272.

John, R. W. and Tobin, J. O'H. Neonatal *Herpesvirus hominis* infections. *Postgrad. med. J.*, 1973, **49,** 380.

Johnson, R. and Sneath, P. H. A. Taxonomy of *Bordetella* and related organisms of the families *Achromobacteraceae, Brucellaceae* and *Neisseriaceae*. *Int. J. syst. Bact.*, 1973, **23,** 381.

Johnston, N. A. *Treponema pallidum* haemagglutination test for syphilis: evaluation of a modified micro-method. *Brit. J. vener. Dis.*, 1972, **48,** 474.

Johnston, N. A. Neonatal congenital syphilis: diagnosis by the absorbed fluorescent treponemal antibody (IgM) test. *Brit. J. vener. Dis.*, 1972, **48,** 464.

Jones, D. M. Meningococcal infection: serological studies. (Abstract) *J. clin. Path.*, 1972, **25,** 1010.

Jones, D. M. and Tobin, B. M. Incidence of haemagglutinating antibodies to meningococci in north-west England. *J. clin. Path.*, 1972, **25,** 955.

Jones, D. M., Tobin, B. M. and Butterworth, A. Three cases of meningococcal infection in a family, associated with a deficient immune response. *Arch. Dis. Childh.*, 1973, **48,** 742.

Karim, K. A. and Ludlam, G. B. Haemagglutination test for toxoplasmosis. (Letter) *J. clin. Path.*, 1973, **26,** 162.

Kelsey, J. C. The AP syndrome. (Letter) *Brit. med. J.*, 1973, iv, 360.

Kelsey, J. C. Killing bacteria: why and whether. *Hlth soc. Serv. J.*, 1973, Suppl. (Cent. steril. Club XV annu. Meet., Reading, 1973) p.3.

Kelsey, J. C. Personal view. *Brit. med. J.*, 1973, iv, 104.

Kennedy, D. H., Walker, G. H., Fallon, R. J., Boyd, J. F., Gross, R. J. and Rowe, B. An outbreak of infantile gastroenteritis due to *E. coli* 0142. *J. clin. Path.*, 1973, **26**, 731.

Kwantes, W., Brooks, R., Payne, R. A. and James, W. E. B. Standard specimen containers. (Letter) *Gaz. Inst. med. Lab. Tech.*, 1973, **17**, 43.

Langford, E. V. and Leach, R. H. Characterization of a mycoplasma isolated from infectious bovine keratoconjunctivitis: *M. bovoculi* sp. nov. *Canad. J. Microbiol.*, 1973, **19**, 1435.

Lapage, S. P. Practical aspects of probabilistic identification of bacteria. *Abstr. I. int. Congr. Bact., Jerusalem, 1973*, 1973, **2**, 85.

Lapage, S. P., Bascomb, S., Willcox, W. R. and Curtis, M. A. Identification of bacteria by computer: general aspects and perspectives. *J. gen. Microbiol.*, 1973, **77**, 273.

Lapage, S. P., Clark, W. A., Lessel, E. F., Seeliger, H. P. R. and Sneath, P. H. A. Proposed revision of the International Code of Nomenclature of Bacteria. *Int. J. syst. Bact.*, 1973, **23**, 83.

Lapage, S. P., Efstratiou, A. and Hill, L. R. The ortho-nitrophenol (ONPG) test and acid from lactose in Gram-negative genera. *J. clin. Path.*, 1973, **26**, 821.

Lapage, S. P., Johnson, R. and Holmes, B. Bacteria from intravenous fluids. *Lancet*, 1973, ii, 284.

Lapage, S. P. and Owen, R. J. *Flavobacterium meningosepticum* from cases of meningitis in Botswana and England. *J. clin. Path.*, 1973, **26**, 747.

Lapage, S. P. and Redway, K. F. Preservation of microorganisms. In: *CRC Handbook of microbiology*, edited by A. I. Larkin & H. A. Lechevalier. Cleveland, Chemical Rubber Company, 1973, **1**, 713.

Leach, R. H. The classification of mycoplasmas from cattle. *Proc. I Conf. Taxon. Physiol. Mycoplasmas, Brno, 1970.* In: *In vitro v ČSSR*, 1973, 2/1, p. 46.

Leach, R. H. Further studies on classification of bovine strains of Mycoplasmatales, with proposals for new species, *Acholeplasma modicum* and *Mycoplasma alkalescens*. *J. gen. Microbiol.*, 1973, **75**, 135.

Lee, J. A. Salmonellae in poultry in Great Britain. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p.197.

Le Minor, L., Coynault, C., Rohde, R., Rowe, B. and Aleksic, S. Localisation plasmidique du déterminant génétique du caractère atypique "saccharose+" des *Salmonella*. *Ann. Microbiol., Paris*, 1973, **124B**, 295.

Le Minor, L., Rohde, R. and Rowe, B. Supplément No. XVI au schéma de Kauffmann-White. *Ann. Microbiol., Paris*, 1973, **124 B**, 169.

Lidwell, O. M. Unidirectional ('laminar') air flow for ventilation of patient rooms. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands, 1972*, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.534.

Lidwell, O. M. The ventilation of surgical operation rooms: the last 50 years. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands, 1973*, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p. 561.

Lidwell, O. M. and Brock, B. Some aspects of the dispersal of *Staphylococcus aureus* in hospital wards. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands, 1972*, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.454.

Lockey, Eunice, Cossart, Y. E. and Gonzalez-Lavin, L. Serum hepatitis after open-heart surgery. *Thorax*, 1973, **28**, 188.

Love, Wendy, Jones, M., Andrews, B. E. and Thomas, M. E. M. Mycoplasmas in human infertility. (Letter) *Lancet*, 1973, i, 1130.

McGhie, D., Hutchison, J. G. P. and Finch, R. G. Stimulation of growth on a deficient medium of a *Klebsiella aerogenes* species by sulphonamide, para-amino benzoic acid, nitrofurantoin and some other substances. *J. clin. Path.*, 1972, **25**, 976.

Mackenzie, D. W. R. Capillary-action replicator. *J. clin. Path.*, 1973, **26,** 805.

MacSween, R. N. M., Galbraith, I., Thomas, M. A., Watkinson, G. and Ludlam, G. B. Phytohaemagglutinin (PHA) induced lymphocyte transformation and *Toxoplasma gondii* antibody studies in primary biliary cirrhosis: evidence of impaired cell-mediated immunity. *Clin. exp. Immunol.*, 1973, **15,** 35.

Mair, Hélène J. Rubella vaccination and termination of pregnancy. *Nurs. Mirror*, 1973, **136,** No. 23, 28.

Mair, N. S. Yersiniosis in wildlife and its public health implications. *J. Wildlife Dis.*, 1973, **9,** 64.

Mair, N. S. and Fox, E. An antigenic relationship between *Yersinia pseudotuberculosis* type 6 and *Escherichia coli* O-group 55. *Contrib. Microbiol. Immunol.*, 1973, **2,** 180.

Mamattah, H. J. K. M., Beard, C. H. and Jones, D. M. Bacteraemia in a burned patient. (Abstract) *J. clin. Path.*, 1973, **26,** 388.

Mann, P. G. and Richens, E. R. Aspects of human brucellosis. *Postgrad. med. J.* 1973, **49,** 523.

Mann, P. G. and Richens, E. R. Leucocyte migration inhibition in relation to human brucellosis. (Abstract) *J. clin. Path.*, 1973, **26,** 386.

Manners, B. T. B., Dulake, C., Grieve, N. W. T., Grob, P. R. and Beynon, G. P. J. The prevalence of renal abnormalities in women with urinary tract infection: a study from general practice. *J. R. Coll. gen. Practit.*, 1973, **23,** 539.

Manners, B. T. B., Grob, P. R., Dulake, C. and Grieve, N. W. T. The interrelationships of asymptomatic bacteriuria, acute bacterial pyelonephritis and bacterial cystitis in women. In: *Urinary tract infection: proceedings of the second national symposium, London, 1972* edited by W. Brumfitt & A. W. Asscher. London, O. U. P., 1973, p. 186.

Marks, J. Classification of the mycobacteria in relation to clinical significance. *Tubercle, Lond.*, 1972, **53,** 259.

Marks, J. Identification of mycobacteria as a clinical service. *Ann. Soc. belge Méd. trop.*, 1973, **53,** 247.

Martin, Diana R. Mucoid variation in *Pseudomonas aeruginosa* induced by the action of phage. *J. med. Microbiol.*, 1973, **6,** 111.

Maskell, Rosalind M. A controlled trial of the use of dip slides in general practice for the diagnosis of urinary infection. *J. clin. Path.*, 1973, **26,** 181.

Maskell, Rosalind M. and Polak, A. Bacteriological facilities for the diagnosis of urinary infection in general practice. In: *Urinary tract infection: proceedings of the second national symposium, London, 1972*, edited by W. Brumfitt & A. W. Asscher. London, O.U.P., 1973, p.3.

Maurer, Isobel M. Disinfection and sterilisation in domiciliary nursing. *Nurs. Mirror*, 1973, **136,** No. 17, 46; reprinted from *Distr. Nurs.*, 1972, **15,** No. 7, 138.

Maxted, W. R. and Widdowson, J. P. The protein antigens of group A streptococci. In: *Streptococci and streptococcal diseases: recognition, understanding and management*, edited by L. W. Wannamaker & J. M. Matsen. New York, Academic Press, 1972, p.251, also contributions to discussion.

Maxted, W. R., Widdowson, J. P. and Fraser, C. A. M. Antibody to streptococcal opacity factor in human sera. *J. Hyg., Camb.*, 1973, **71,** 35.

Maxted, W. R., Widdowson, J. P. and Fraser, C. A. M. Use of the serum-opacity reaction in the typing of group-A streptococci. (Abstract) *J. med. Microbiol.*, 1973, **6,** Pxiii.

Maxted, W. R., Widdowson, J. P., Fraser, C. A. M., Ball, L. C. and Bassett, D. C. J. The use of the serum opacity reaction in the typing of group-A streptococci. *J. med. Microbiol.*, 1973, **6,** 83.

Meers, P. D. Allergy and cancer. (Letter) *Lancet*, 1973, i. 884.

Meers, P. D. Bacteroides infections. (Letter) *Lancet*, 1973, ii. 573.

Meers, P. D., Calder, M. W., Mazhar, M. M. and Lawrie, G. M. Intravenous infusion of contaminated dextrose solution: the Devonport incident. *Lancet*, 1973, ii, 1189.

MEERS, P. D. and HUNT, A. C. The localization of viable bacteria in tissue. *J. clin. Path.*, 1972, **25**, 1000.

MEYRICK, E. A. and SMITH, M. S. Electron microscopy in the rapid screening of sera for the presence of H.A.A. (hepatitis associated antigen). *Med. Lab. Tech.*, 1973, **30**, 391.

MILLARD, P. R., HERBERTSON, B. M., NAGINGTON, J. and EVANS, D. B. The morphological consequences and the significance of cytomegalovirus infection in renal transplant patients. *Quart. J. Med.*, 1973, **42**, 585.

MILLER, D. L. Collaborative studies of acute respiratory disease in patients seen in general practice, and in children admitted to hospital: aims, field methods and morbidity rates. *Postgrad. med. J.*, 1973, **49**, 749.

MILLER, D. L., REID, D., DIAMOND, J. R., PEREIRA, M. S. and CHAKRAVERTY, P. Hong Kong influenza in the Royal Air Force 1968-70. *J. Hyg., Camb.*, 1973, **71**, 535.

MITCHELL, E. R. The Control of Infection Committee position and authority. *Hlth. soc. Serv. J.*, 1973, Suppl. (Cent. steril, Club XV annu. Meet., Reading, 1973) p.15.

MITCHELL, N. J. and GAMBLE, D. R. Evaluation of the new " Williams " anaesthetic filter. *Brit. med. J.*, 1973, ii, 653.

MORRIS, C. A., CONWAY, H. D. and EVERALL, P. H. Food-poisoning due to staphylococcal enterotoxin E. (Letter) *Lancet*, 1972, ii, 1375.

MORRIS, C. A. and GRANT, G. H. Cervical adenitis caused by *Mycobacterium chelonei* (*M. abscessus*). (Abstract) *J. clin. Path.*, 1972, **25**, 1006.

MORRIS, C. A., GRANT, G. H., EVERALL, P. H. and MYRES, A. T. M. Tuberculoid lymphadenitis due to *Mycobacterium chelonei.* *J. clin. Path.*, 1973, **26**, 422.

NAGINGTON, J. Microbiological aspects of transplanation: viruses. (Abstract) *J. clin. Path.*, 1973, **26**, 391.

NAGINGTON, J. and RUBENSTEIN, D. Virus infections of the upper respiratory tract. *Brit. J. Hosp. Med.*, 1973, **10**, 565.

NAKHLA, L. S. Genetic determinants of trimethoprim resistance in a strain of *Staphylococcus aureus.* *J. clin. Path.*, 1973, **26**, 712.

NAKHLA, L. S. A serological method for distinguishing coagulase-negative staphyloccocci from micrococci. *J. clin. Path.*, 1973, **26**, 511; also abstract in *J. med. Microbiol.*, 1973, **6**, Pviii.

NEARY, M. P., ALLEN, J., OKUBADEJO, O. A. and PAYNE, D. J. H. Preoperative vaginal bacteria and postoperative infections in gynaecological patients. *Lancet*, 1973, ii, 1291.

NOAH, N. D. The bacteriologist in the supermarket. *Hlth Mag.*, 1973, **10**, No. 3, 42.

NOONE, P. and SHAFI, M. S. Controlling infection in a district general hospital. *J. clin. Path.*, 1973, **26**, 140.

OAKES, Mary, HUMAN, R. P. and MEERS, P. D. Serum-levels of four antibotics administered orally to patients in general practice. *Lancet*, 1973, i, 222.

OKUBADEJO, O. A., GREEN, P. J. and PAYNE, D. J. H. Bacteroides in the blood. (Letter) *Lancet*, 1973, i, 147.

OKUBADEJO, O. A., GREEN, P. J. and PAYNE, D. J. H. Bacteroides infection among hospital patients. *Brit. med. J.*, 1973, ii, 212.

OKUBADEJO, O. A. and MASKELL, R. M. Thymine-requiring mutants of *Proteus mirabilis* selected by co-trimoxazole *in vivo.* *J. gen. Microbiol.*, 1973, **77**, 533.

OLURIN, O., FLECK, D. G. and OSUNTOKUN, B. Toxoplasmosis and chorioretinitis in Nigeria. *Trop. geogr. Med.*, 1972, **24**, 240.

ØRSKOV, Ida, ØRSKOV, F. and ROWE, B. Three new *Escherichia coli* O antigens, 0154, 0155 and 0156, and one new K antigen, K94. *Acta path. microbiol. scand. B*, 1973, **81**, 59.

OWEN, R. J. and SNELL, J. J. S. Comparison of group IIf with *Flavobacterium* and *Moraxella.* *Antonie van Leeuwenhoek*, 1973, **39**, 473.

PARKER, M. T. Antibiotics and resistance of staphylococci. In: *Current antibiotic therapy*, edited by A. M. Geddes & J. D. Williams. Edinburgh, Churchill Livingstone, 1973, p.131.

Parker, M. T. Characterization and typing of *Pseudomonas aeruginosa*. (Abstract) *J. gen. Microbiol.*, 1972, **73**, vi.

Parker, M. T. Phage-typing of *Staphylococcus aureus*. In: *Methods in microbiology*, edited by J. R. Norris & D. W. Ribbons. London, Academic Press, 1972, **7B**, 1.

Parker, M. T. Transmission in hospitals. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology Enschede, Netherlands, 1972*, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.438.

Paull, A. An environmental study of the opportunist mycobacteria. *Med. Lab. Tech.*, 1973, **30**, 11.

Paver, W. K., Caul, E. O., Ashley, C. R. and Clarke, S. K. R. A small virus in human faeces. (A report to the Public Health Laboratory Service Working-Party on Epidemic Non-bacterial Gastroenteritis) *Lancet*, 1973, i, 237.

Payne, D. J. H. and Okubadejo, O. A. Bacteroides infections. (Letter) *Lancet*, 1973, ii, 845.

Pead, P. J. Rubella reinfections. (Letter) *Lancet*, 1973, ii, 149.

Pead, P. J. Rubella-specific IgM antibody as an aid to diagnosis. (Letter) *Lancet*, 1973, ii, 497.

Pead, P. J. and Holley, A. Estimation of virus-neutralizing antibody in microplates. *J. clin. Path.*, 1973, **26**, 17.

Pearson, A. D., Calder, M. W. and Meers, P. D. Assay of endotoxin. (Letter) *Lancet*, 1973, i, 1194.

Pearson, A. D., Scarfe, S., Morgan, T. A. and Pollard, R. Evidence of a pattern in the variable host response to brucella in man. *Lancet*, 1973, i, 593.

Peffers, A. S. R., Bailey, J., Barrow, G. I. and Hobbs, B. C. *Vibrio parahaemolyticus* gastroenteritis and international air travel. *Lancet*, 1973, i, 143.

Pereira, Marguerite S. Adenovirus infections. *Postgrad. med. J.*, 1973, **49**, 798.

Pereira, Marguerite S., Chakraverty, P., Schild, G. C., Coleman, M. T. and Dowdle, W. R. Prevalence of antibody to current influenza viruses and effect of vaccination on antibody response. *Brit. med. J.*, 1972, iv, 701.

Pinney, Alison M., Widdowson, J. P. and Maxted, W. R. The extracellular M protein of group-A streptococci. (Abstract) *J. med. Microbiol.*, 1973, **6**, Pxiv.

Pollock, T. M. [Contributions to discussion] In: *Intrauterine infections*, edited by K. Elliott & J. Knight. Amsterdam, Associated Scientific Publishers, 1973. (CIBA Foundation Symposium 10 N.S.)

Pollock, T. M. Some aspects of vaccine assessments in England. *Symp. Ser. immunobiol. Standard.*, 1973, **22**, 353.

Poole, Pauline M. and Tobin, J. O'H. Viral and epidemiological findings in MRC/PHLS surveys of respiratory disease in hospital and general practice. *Postgrad. med. J.*, 1973, **49**, 778.

Pykett, Angela M. Isolation of *Neisseria lactamicus* from the nasopharynx. *J. clin. Path.*, 1973, **26**, 399.

Rahman, A. F. M. S. Early detection of influenza virus in cell culture by means of immunofluorescence. *J. clin. Path.*, 1973, **26**, 503.

Richmond, S. J., Hilton, A. L. and Clarke, S. K. R. Chlamydial infection: role of chlamydia subgroup A in non-gonococcal and post-gonococcal urethritis. *Brit. J. vener. Dis.*, 1972, **48**, 437.

Roberts, T. A., Thomas, A. I. and Gilbert, R. J. A third outbreak of type C botulism in broiler chickens. *Vet. Rec.*, 1973, **92**, 107.

Robertson, L., Farrell, I. D. and Hinchliffe, P. M. The sensitivity of *Brucella abortus* to chemotherapeutic agents. *J. med. Microbiol.*, 1973, **6**, 549.

Rodgers, F. G. Infection, haemorrhage and death of chick embryos after inoculation of herpes simplex virus type 2 on to the chorioallantoic membrane. *J. gen. Virol.*, 1973, **21,** 187.

Rodin, P. and Seth, A. D. Treatment of gonorrhoea with cotrimoxazole, procaine penicillin alone, and procaine penicillin plus probenecid. *Brit. J. vener. Dis.*, 1972, **48,** 517.

Rotter, M., Asheshov, E. H. and Parker, M. T. Vergleichende Untersuchungen zur Agardiffusionsmethode für die Erstellung von Antibiogrammen. *Zbl. Bakt. 1 Abt. Ref.*, 1972, **230,** 330.

Rowe, B. The role of *Escherichia coli* in the diarrhoea of adults. *VI int. Symp. World Ass. vet. Food-Hygienists, Elsinore, 1973*, 1973, Paper No. 4.

Rowe, B. *Salmonella virchow:* England, Wales. *Morbid. & Mortal.*, 1973, **22,** 199.

Rowe, B. Salmonellosis in England and Wales. In: *The microbiological safety of food*, edited by B. C. Hobbs & J. H. B. Christian. London, Academic Press, 1973, p.165.

Russell, A. S., Maini, R. A., Bailey, M. and Dumonde, D. C. Cell-mediated immunity to varicella-zoster antigen in acute herpes zoster (shingles). *Clin. exp. Immunol.*, 1973, **14,** 181.

Ryan, W. J. Throat infection and rash associated with an unusual corynebacterium. *Lancet*, 1972, ii, 1345.

Sanborn, W. R., Benčić, Z., Cvjetanović, B., Gotschlich, E. C., Pollock, T. M. and Sippel, J. E. Trial of a serogroup A meningococcus polysaccharide vaccine in Nigeria. *Progr. immunobiol. Standard.*, 1972, **5,** 497.

Schaefer, W. B., Beer, J. V., Wood, N. A., Boughton, E., Jenkins, P. A. and Marks, J. A bacteriological study of endemic tuberculosis in birds. *J. Hyg., Camb.*, 1973, **71,** 549.

Schaefer, W. B., Wolinsky, E., Jenkins, P. A. and Marks, J. *Mycobacterium szulgai*—a new pathogen: serologic identification and report of five new cases. *Amer. Rev. resp. Dis.*, 1973, **108,** 1320.

Schild, G. C., Henry-Aymard, M., Pereira, M. S., Chakraverty, P., Dowdle, W., Coleman, M. and Chang, W. K. Antigenic variation in current human type A influenza-viruses: antigenic characteristics of the variants and their geographic distribution. *Bull. World. Hlth Org*, 1973, **48,** 269.

Schild, G. C., Pereira, M. S., Chakraverty, P., Coleman, M. T., Dowdle, W. R. and Chang, W. K. Antigenic variants of influenza B virus. *Brit. med. J.*, 1973, iv, 127.

Scrimgeour, G. and Rodin, P. Comparison of the rapid plasma reagin card test and other screening tests for treponemal disease in patients attending a venereal disease clinic. *Brit. J. vener. Dis.*, 1973, **49,** 342.

Selkon, J. B. Asymptomatic bacteriuria. (Letter) *Lancet*, 1973, ii, 162.

Shannon, R. and Hedges, A. J. Reversibility of the specific adsorption of colicin E2-P9 to cells of colicin-sensitive strains of *Escherichia coli.* *J. Bact.*, 1973, **116,** 1136.

Sharp, D. S. and MacDonald, H. Use of medroxyprogesterone acetate as a contraceptive in conjunction with early postpartum rubella vaccination. *Brit. med. J.*, 1973, iv, 443.

Sharp, J. C. M. and Fletcher, W. B. Experience of anti-vaccinia immunoglobulin in the United Kingdom. *Lancet*, 1973, i, 656.

Sharpe, M. Elisabeth, Hill, L. R. and Lapage, S. P. Pathogenic lactobacilli. *J. med. Microbiol.*, 1973, **6,** 281.

Sharpe, W., Haines, C. R., Ironside, A. G., Jones, D. M. and Abbott, J. D. Control of an outbreak of meningococcal meningitis in a day school. *Community med.*, 1972, **129,** 211.

Smith, H. R., Grindley, N. D. F., Humphreys, G. O. and Anderson, E. S. Interactions of group H resistance factors with the F factor. *J. Bact.*, 1973, **115,** 623.

Smith, H. R., Humphreys, G. O., Grindley, N. D. F., Grindley, J. N. and Anderson, E. S. Molecular studies of an *fi*+ plasmid from strains of *Salmonella typhimurium.* *Molec. gen. Genet.*, 1973, **126,** 143.

Smith, J. W. G. Immunization schedules. *Symp. Ser. immunobiol. Standard.*, 1973, **22**, 119.

Smith, J. W. G. Toxoides difterico y tetanico. *Bol. Ofic. sanit. panamer.*, 1973, **74**, 152; reprinted from *Brit. med. Bull.*, 1969, **25**, 177.

Smith, J. W. G. and Pollard, R. Influenza vaccination in industry: report of a study in the Post Office, 1971-1972. *Symp. Ser. immunobiol. Standard.*, 1973, **20**, 275.

Smith, J. W. G. and Pollard, R. Studies on influenza vaccine in industry. *Postgrad. med. J.*, 1973, **49**, 169.

Sneath, P. H. A. and Johnson, R. Numerical taxonomy of *Haemophilus* and related bacteria. *Int. J. syst. Bact.*, 1973, **23**, 405.

Snell, J. J. S., Hill, L. R. and Lapage, S. P. Identification and characterization of *Moraxella phenylpyruvica*. *J. clin. Path.*, 1972, **25**, 959.

Snell, J. J. S. and Lapage, S. P. Carbon source utilization tests as an aid to the classification of non-fermenting Gram-negative bacteria. *J. gen. Microbiol.*, 1973, **74**, 9.

Stevens, M. and Mair, N. S. A numerical taxonomic study of *Yersinia enterocolitica* strains. *Contrib. Microbiol. Immunol.*, 1973, **2**, 17.

Stevenson, J. and Hambling. M. H. Infections due to viruses and allied organisms. In: *Textbook of paediatrics*, edited by J. O. Forfar & G. C. Arneil. Edinburgh, Churchill Livingstone, 1973, p.1352.

Stipkovtis, L., Varga, L., Schimmel, D. and Leach, R. H. Study of acholeplasma strains isolated from swine. *Proc. II Conf. Taxon. Physiol. Mycoplasmas, Brno*, 1972, In: *In vitro v ČSSR*, 1973, 2/1, p.191.

Taylor, C. E. D. Microbial disease in general hospitals. *Medicine, Lond.*, 1972, No. 5, 356.

Taylor, C. E. D. Smallpox. (Letter) *Brit. med. J.*, 1973, ii, 781.

Taylor, C. E. D., Heimer, G. V. and Tomlinson, A. H. A guide to the choice of optical equipment and reagents for immunofluorescence techniques. *Broadsheet Ass. clin. Path.*, 1973, No. 76.

Tee, G. H. *Lancet* cover blown? (Letter) *Lancet*, 1973, i, 150.

Thomas, Mair E. M. A bacteriologist in the kitchen. *Hlth Mag.*, 1973, **10**, No. 2, 20.

Thomas, Mair E. M. The role of the bacteriologist. *Hlth soc. Serv. J.*, 1973, Suppl. (Cent. steril. Club XV annu. Meet., Reading, 1973) p.18.

Thomas, Mair E. M. Surgical sterility. (Letter) *Lancet*, 1973, i, 105.

Thomas, Mair E. M. and Bond, L. Failure of *Escherichia coli* to grow on lysed blood agar. *Med. Lab. Tech.*, 1973, **30**, 277.

Thomas, Mair E. M., Brooks, D. and Beazley, J. M. Pathogenesis of the urethral syndrome: medical forum. *Mod. Med. G. B.*, 1973, **18**, 483.

Thomas, Mair E. M. and Newell, L. How a bacteriologist provides microbes with a suitable environment in which to grow. *Hlth Mag.*, 1972, **9**, No. 4, 21.

Thomas, Mair E. M. and Tillett, H. E. Dysentery in general practice: a study of cases and their contacts in Enfield, and an epidemiological comparison with salmonellosis. *J. Hyg., Camb.*, 1973, **71**, 373.

Thomas, Mair E. M. and Tillett, H. E. Sonne dysentery in day schools and nurseries: an eighteen-year study in Edmonton. *J. Hyg., Camb.*, 1973, **71**, 593.

Thompson, R. G. and Harper, I. A. Acute appendicitis and salmonella infections. (Letter) *Brit. med. J.*, 1973, ii, 300.

Threlfall, E. J., Oliver, W. T. and Anderson, E. S. Drug resistance in an animal-human outbreak of *Salmonella typhimurium*. *Abstr. VIII int. Congr. Chemother., Athens, 1973*, 1973, Vol. **A**, Abstr. No. A-27.

Tobin, J. O'H. The virus laboratory in the diagnosis and prevention of congenital infections. In: *Intrauterine infections*, edited by K. Elliott & J. Knight. Amsterdam, Associated Scientific Publishers, 1973. (CIBA Foundation Symposium 10 N.S.) p. 53, also contributions to discussion.

Tobin, J. O'H., de Silva, L. M. and Cavanagh, P. Studies on the value of IgG, IgM and IgA antibody levels in the epidemiology of influenza. (Abstract) *J. med. Microbiol.*, 1973, **6**, Pxv.

Tomlinson, A. H. and MacCallum, F. O. Pyrimidine analogues in the treatment of experimental herpes infections. *Postgrad. med. J.*, 1973, **49**, 416.

Tomlinson, A. H. and MacCallum, F. O. Virus antigen in cells of lumbar cerebrospinal fluid. (Letter) *Lancet*, 1973, i, 319.

Towers, Adeline G. Unidirectional airflow in rooms for several patients. In: *Airborne transmission and airborne infection: concepts and methods presented at the IV International Symposium on Aerobiology, Enschede, Netherlands, 1972*, edited by J. F. P. Hers & K. C. Winkler. Utrecht, Oosthoek Publishing Company, 1973, p.525.

Townshend, R. H., Jephcott, A. E. and Yekta, M. H. Erysipelothrix septicaemia without endocarditis. *Brit. med. J.*, 1973, i. 464.

Townshend, R. H., Yekta, M. H. and Jephcott, A. E. Erysipelothrix septicaemia. (Letter) *Brit. med. J.*, 1973, ii, 303.

Turk, D. C. Aspects of the epidemiology of haemophilus meningitis. (Abstract) *J. clin. Path.*, 1972, **25**, 1010.

Turner, G. C. A new look at infectious diseases: hepatitis. *Brit. med. J.*, 1973, i, 476.

Turner, L. H. A new look at infectious diseases: leptospirosis. *Brit. med. J.*, 1973, i, 537.

Urquhart, G. E. D. and Walker, G. H. Immunofluorescent techniques for the diagnosis of respiratory syncytial virus. (Letter) *J. clin. Path.*, 1973, **26**, 807.

Wales, J. K. and Hambling, M. H. Coxsackie B virus and diabetes. (Letter) *Brit. med. J.*, 1973, ii, 120.

Walker, D. M., Dolby, A. E., Joynson, D. H. M. and Jacobs, A. Mitotic index and migration inhibition factor: effect of two different culture media. *J. immunol. Meth.*, 1973, **3**, 315.

Whelan, J. P. F. and Hale, J. H. Bactericidal activity of metronidazole against *Bacteroides fragilis*. *J. clin. Path.*, 1973, **26**, 393.

White, W. G., Barnes, G. M., Barker, E., Gall, D., Knight, P., Griffith, A. H. Morris-Owen, R. M. and Smith, J. W. G. Reactions to tetanus toxoid. *J. Hyg., Camb.*, 1973, **71**, 283.

White, W. G. and Smith, J. W. G. Duration of immunity after tetanus vaccination. (Letter) *Lancet*, 1973, ii, 965.

Whitehead, J. E. M. Bacterial resistance: changing patterns of some common pathogens. *Brit. med. J.*, 1973, ii, 224.

Whitehead, J. E. M. Silent infections and the epidemiology of viral carditis. *Amer. Heart J.*, 1973, **85**, 711.

Widdowson, Jean P. and Maxted, W. R. Antibody response in man to infection with various M-types of group-A streptococci. (Abstract) *J. med. Microbiol.*, 1973, **6**, Pxiv.

Wigfield, A. S., Selkon, J. B. and Rich, G. E. Single-session treatment of uncomplicated gonorrhoea in men, using penicillin combined with cotrimoxazole: controlled trial comparing four different treatment schedules, with observations on antibiotic sensitivities of gonococci and a review of the literature. *Brit. J. vener. Dis.*, 1973, **49**, 277.

Wilkinson, A. E. Fluorescent treponemal antibody tests on cerebrospinal fluid. *Brit. J. vener. Dis.*, 1973, **49**, 346.

Willcox, W. R., Lapage, S. P., Bascomb, S. and Curtis, M. A. Identification of bacteria by computer: theory and programming. *J. gen. Microbiol.*, 1973, **77**, 317.

Williams, W. J., Pioli, E., Jones, D. J. and Dighero, M. The Kmif (Kveim-induced macrophage migration inhibition factor) test in sarcoidosis. *J. clin. Path.*, 1972, **25**, 951.

Willis, A. T. Anaerobic bacterial diseases. *Abstr. VIII int. Congr. Chemother., Athens. 1973*, 1973, Vol. **C**, Abstr. No. A viii-1.

Willis, A. T. A breast milk substitute. *Mod. Mother.*, 1973, Jan./Feb., p.34.

Willis, A. T. Some diseases due to clostridia. *Med. Cent. J. Luton & Dunstable Hosp.*, 1973, No. 19, p.12.

Willis, A. T., Bullen, C. L., Williams, K., Fagg, C. G., Bourne, A. and Vignon, M. Breast milk substitute: a bacteriological study. *Brit. med. J.*, 1973, iv, 67.

Windsor, B. P. G., Langsdale, G. A., Hill, J., Hooper, W. L. and Allen, H. A. Sulfametopyrazine single-dose treatment of urinary tract infections in general practice. *Brit. J. clin. Pract.*, 1973, **27**, 15.

Windsor, G. D., Nicholls, A., Maini, R. N., Lemcke, R., Edward, D. G. ff. and Dumonde, D. C. Search for mycoplasma in synovial fluids from patients with rheumatoid arthritis. *Ann. rheum. Dis.*, 1973, **32**, 389.

Books

Hobbs, Betty C. and Christian, J. H. B. *eds* *The microbiological safety of food: proceedings of the eighth International Symposium on Food Microbiology, Reading, 1972.* London, Academic Press, 1973.

Illis, L. S. and Gostling, J. V. T. *Herpes simplex encephalitis.* Bristol, Scientechnica, 1972.

Mahgoub, E. S. and Murray, I. G. *Mycetoma.* London, Heinemann, 1973.

Snell, J. J. S. *The distribution and identification of non-fermenting bacteria.* London, H.M.S.O., 1973 (Public Health Laboratory Service Monograph Series No. 4)

Reports of the Public Health Laboratory Service, including reports of Committees and Working Parties

Acute respiratory virus diseases: a symposium, Sheffield, 1973, to report the results of a collaborative study by the Public Health Laboratory Service and the Medical Research Council, edited by D. L. Miller. *Postgrad. med. J.*, 1973, **49**, 747.

A comparative assessment of media for the isolation and enumeration of coagulase positive staphylococci from foods: a report from a working party of the Public Health Laboratory Service. *J. appl. Bact.*, 1972, **35**, 673.

Efficacy of whooping-cough vaccines used in the United Kingdom before 1968: final report to the Director of the Public Health Laboratory Service by the Public Health Laboratory Service Whooping-cough Committee and Working Party. *Brit. med. J.*, 1973, i, 259.

Public Health Laboratory Service Board accounts, 1971-72. *House of Commons Papers* (Session 1972-73), No. 163. London, H.M.S.O., 1973.

Public Health Laboratory Service 1973 *Year Book, including annual report for 1972.* London, 1973.

Reports of Committees and Working Parties of other organisations to which members of the staff have contributed

BRITISH PHARMACOPOEIA COMMISSION: AD HOC COMMITTEE ON MICROBIAL CONTAMINATION. Appendix XVI. In: *British pharmacopoeia 1973.* London, H.M.S.O., 1973, p.A121.

COMMON MARKET SCIENTIFIC VETERINARY GROUP ON SALMONELLOSIS. Comparative studies on the isolation of ' sublethally injured ' salmonellae in nine European laboratories, by W. Edel & E. H. Kampelmacher, on behalf of the members of a working group. *Bull. World Hlth Org.*, 1973, **48**, 167.

INTERNATIONAL ASSOCIATION OF MICROBIOLOGICAL SOCIETIES: SECTION ON CULTURE COLLECTIONS. Minutes of Meeting, Mexico City. 1970. *Int. J. syst. Bact.*, 1972, **22**, 406.

INTERNATIONAL COMMITTEE FOR ENTERIC PHAGE-TYPING (ICEPT). The geographical distribution of *Salmonella typhi* and *Salmonella paratyphi* A and B phage types during the period 1 January 1966 to 31 December 1969: a report of the International Committee for Enteric Phage-Typing (ICEPT). *J. Hyg., Camb.*, 1973, **71**, 59.

INTERNATIONAL COMMITTEE ON SYSTEMATIC BACTERIOLOGY: SUBCOMMITTEE ON THE TAXONOMY OF PASTEURELLA, YERSINIA AND FRANCISELLA. Minutes of Meeting, Malmö, 1972. *Int. J. syst. Bact.*, 1972, **22**, 401.

MEDICAL RESEARCH COUNCIL. La vacuna BCG y la preparada con BRC para la prevencíon de la tuberculosis en los adolescentes y adultos jovenes: cuarto informe presentado al Consejo de Investigaciones Médicas por su Comité de Pruebas Clínicas de Vacunas Antituberculosas. *Bol. Ofic. sanit. panamer.*, 1972, **73**, 531; reprinted from *Bull. World Hlth Org.*, 1972, **46**, 371.

SOCIETY FOR APPLIED BACTERIOLOGY. Techniques for the isolation and characterization of *Actinomyces* and *Bifidobacterium* species: report of a panel discussion. In: *Acitnomycetales: characteristics and practical importance*, edited by G. Sykes & F. A. Skinner. London, Academic Press, 1973. (Soc. appl. Bact. Symp. Ser. No. 2) p.327.

SOUTH-EAST METROPOLITAN REGIONAL THORACIC SOCIETY. Relapse in tuberculosis: a report from the Research Committee. *Brit. J. Dis. Chest.*, 1973, **67**, 33.

WORLD FEDERATION FOR CULTURE COLLECTIONS. Minutes of the Extraordinary Meeting of the Provisional Board, Mexico City, 1970. *Int. J. syst. Bact.*, 1972, **22**, 404.

WORLD FEDERATION FOR CULTURE COLLECTIONS. Statutes. *Int. J. syst. Bact.*, 1972, **22**, 407.

WORLD HEALTH ORGANIZATION. Health criteria for the quality of recreational waters, with special reference to coastal waters and beaches. 1972. WHO/W.POLL/72.10 (Wld Hlth Org. working document)

WORLD HEALTH ORGANIZATION. Research needs in leptospirosis. *Bull. World Hlth Org.*, 1972, **47**, 113.

WORLD HEALTH ORGANIZATION. WHO collaborative studies on enterovirus reference antisera: fourth report, by J. L. Melnick & B. Hampil. *Bull. World Hlth Org.*, 1973, **48**, 381.

AWARDS AND EXTERNAL OFFICES ACCEPTED BY MEMBERS OF THE SERVICE DURING 1973

Professor R. E. O. Williams	Visiting Professor, London School of Hygiene and Tropical Medicine: Consultant Adviser in Microbiology, Department of Health and Social Security; Member, Managing Committee, Bureau of Hygiene and Tropical Diseases.
Professor E. S. Anderson ..	Professor in Applied Biology, School of Biological Sciences, Brunel University; Member, Advisory Committee on Antimicrobial Agents, Health Protection Branch, Canadian Health and Welfare Department.
Dr. A. D. Evans	World Health Organisation short-term consultancy, Ceylon.
Dr. Evelyn M. Finnie ..	Part-time Teacher in Microbiology, Department of Biological Sciences, University of Warwick.
Dr. Sylvia D. Gardner ..	World Health Organisation, short-term consultancy, Ceylon.
Dr. R. W. S. Harvey ..	Member, Animal Unit Committee, Welsh National School of Medicine.
Dr. C. H. L. Howells ..	Chairman, Section of Microbiology, Division of Pathology, University Hospital of Wales.
Mr. M. W. Scruton ..	Member, Technical Committee on Laboratory Autoclaves, British Standards Institute.

GRANTS AND OTHER ASSISTANCE RECEIVED OR RENEWED FOR SPECIAL INVESTIGATIONS IN 1973

The Public Health Laboratory Service Board now receive valuable assistance from the Departmental Research and Development Fund of the Department of Health and Social Security. Allocations from this fund have enabled the Board to undertake the following important projects, involving research work of an " operational " nature:

A study of the use of computers for the identification of bacteria.

Laboratory investigations into farmers' lung.

An investigation of laminar flow ventilation and the determination of its effectiveness in protecting hospital patients who are at special risk to cross-infection.

An investigation into hepatitis in a special community.

The establishment of reference facilities for monitoring transferable drug resistance.

The surveillance of whooping cough and B.C.G. vaccines.

The Board also receive grants from the following bodies for the assistance of special investigations and the acquisition of major equipment of a special nature:

(*a*) From the World Health Organisation:

$5,000 for the assistance of laboratory research on enteric phage-typing at the International Centre recognised at the Enteric Reference Laboratory, Colindale, London.

$5,000 for the International Shigella Centre recognised at the Salmonella and Shigella Reference Laboratory, Colindale, London.

$5,000 for the International Reference Centre for Staphylococcal Phage-typing recognised at the Cross-Infection Reference Laboratory, Colindale, London.

$2,500 towards the cost of testing the specificity of virus antisera at, and the supply of viral antigens and positive control sera by the Standards Laboratory for Serological Reagents, Colindale, London.

$2,500 for the preparation and testing of reagents (rhinovirus), at the Virus Reference Laboratory, Colindale, London.

$4,000 towards the cost of epidemiological serological investigations of tropical sera for antibodies in treponematoses at the Venereal Diseases Reference Laboratory, London Hospital Research Laboratories, London.

$1,500 for research on the bacteriology of leptospirosis at the Leptospirosis Reference Laboratory, London School of Hygiene and Tropical Medicine.

$5,000 for studies on antibiotic resistance in enterobacteriaceae at the Enteric Reference Laboratory, Colindale, London.

$3,000 for investigations on the microbiology of mycobacteria at the Tuberculosis Reference Laboratory, Cardiff.

(*b*) From the British Diabetic Association:

Dr. D. R. Gamble (Director, Public Health Laboratory, Epsom).

Provision for an investigation into certain aspects of viral pancreatitis, and the part played by viral infection in the development of diabetes, with particular reference to coxsackie virus infection.

(*c*) From the Cancer Research Campaign:

Professor R. E. O. Williams (Director, Bacterial Metabolism Research Laboratory, Colindale).

Provision for research on bacteria in the etiology of cancer of the colon and other sites.

Laboratory Directors in the Service are also carrying out investigations in conjunction with general practitioners and hospital medical officers in many places, notably in the study of chronic bronchitis, of hospital cross-infection, and of sterilisation and disinfection problems; on gastro-enteritis and the safety of various foods.

A clause of the Schedule of the Public Health Laboratory Service Act, 1960 permits the Board to accept, hold and administer private gifts on trust for any purpose related to the Public Health Laboratory Service or otherwise connected with bacteriological research. Donations received during 1972 were as follows:

£350 in each of seven years from 1971 to 1977 inclusive, from Ethicon Limited for research in the Cardiff joint Laboratories.

£1,170 from Pfizer Limited towards the cost of research on Indanyl Carbenicillin being undertaken by Dr. D. J. H. Payne of the Portsmouth Laboratory.

£100 from Upjohn Limited for a clinical trial on Bacteroides infection being undertaken at the Portsmouth Laboratory.

£13 from friends and colleagues of the late Mr. J. L. Harris, Works Officer of the Property Services Agency, Department of the Environment, Plymouth.

INDEX TO PERSONAL NAMES

Abbott, J. D., 12, 33, 40, 59, 60, 62, 70
Adams, F. A., iii
Aleksic, S., 66
Allam, N. M., 59
Allchin, A., 65
Allen, Heather A., 9, 73
Allen, J., 68
Almeida, June D., 59
Anderson, E. S., 8, 27, 39, 59, 63, 70, 71, 75
Andrews, B. E., 7, 9, 59, 62, 64, 66
Appleton, Hazel, 9, 59
Archer, J. F., 21
Archibald, H. M., iii
Armstrong, Elizabeth C., 12
Arneil, G. C., 71
Asheshov, Elizabeth A. Hall, 8, 70
Ashley, C. R., 69
Ashton, C. I., 12
Asscher, A. W., 59, 67

Backhouse, Jane N., 7
Bailey, G. K., 15, 62
Bailey, J., 69
Bailey, M., 70
Baillie, Margery B., 12
Ball, L. C., 67
Banner, D., 16
Barker, E., 72
Barker, J., 60
Barker, S. M., 65
Barnard, D. L., 60, 61, 63
Barnes, G. M., 72
Barnett, Hilary J., 10
Barnicot, N. A., 60
Barraclough, H., 7
Barrington, J. W., 7
Barrow, G. I., 19, 34, 41, 42, 60, 64, 69
Bartlett, D. I., 19
Barton, B. W., 14, 40
Bascomb, Shoshana, 60, 66, 72
Bassett, D. C. J., 67
Beard, C. H., 67
Beazley, J. M., 71
Bedson, H. S., 31
Beer, J. V., 70
Benčić, Z., 70
Benn, Patricia M., 19
Bennett, F. J., 60
Bennett, J. C., 60
Berrill, W. T., 60
Beynon, G. P. J., 67
Bhattacharyya, M. N., 60
Bissell, P. S., 60
Black, F. T., 62
Blair, J. N., 53
Blamire, R., 39
Bloch, Terese, 9
Blowers, R., 21, 40, 54, 60
Board, R. G., 64
Boissard, Joan M., 11, 32
Bond, L., 71
Bone, Elizabeth S., 10
Boughton, E., 70
Bound, W. H., 16
Bourne, A., 73
Bourne, M. S., 61
Bowie, I. S., 9
Boxall, E., 61
Boyd, J. F., 66
Boyes, B. E., 61
Bradstreet, C. M. Patricia, 9, 28, 29, 40, 42, 60
Brahms, J., 60
Breckon, D., 13
Brennan, J. L., 60
Bridgwater, F. A. J., 11, 33
Brock, Brenda M., 66
Brogan, T. D., 21
Brooks, D., 71
Brooks, R., 18, 66
Brown, D. F. J., 10
Brumfitt, W., 67
Bryant, R. C., iii
Bryden, A. S., 62
Bullen, Catherine L., 16, 60, 73
Bullin, C. H., 14
Burdin, M. L., 39
Burnett, Judith A., 8
Burrell, G. H., 13
Burt, R., 16
Butterworth, A., 65
Button, Jane, 9
Buxton, M. W. D., 17

Calder, M. W., 17, 67, 69
Carr, Jacqueline M., 8, 59
Cartwright, R. Y., 14, 60
Caul, E. O., 69
Cavanagh, P., 18, 26, 60, 72
Cayton, H. R., 11, 33, 39, 40, 42
Chakraverty, Pratima, 9, 68, 69, 70
Chang, W. K., 70
Chattopadhyay, B., 15
Chessum, B. S., 15, 60
Chester, I. R., 60
Christian, J. H. B., 60, 63, 64, 66, 70, 73
Christie, D. R., 14
Churcher, Gillian M., 17
Clark, R., 15
Clark, W. A., 66
Clarke, Suzanne K. R., 11, 27, 31, 40, 42, 60, 61, 63, 69
Clewer, Anne D. E., 8
Clifford, C. M., 60
Clifford, W., 64
Coates, D., 8
Codd, A. A., 12, 63
Coe, A. W., 8
Coetzee, E. F. C., 14
Coghlan, Joyce D., 10
Cohen, B. J., 9
Coleman, D. V., 61
Coleman, M. T., 69, 70
Coleman, T. J., 14, 61
Collins, C. H., 15, 33, 40, 61
Conway, H. D., 68
Cossart, Yvonne E., 9, 30, 40, 42, 61, 66
Cowburn, G. R., 14
Coynault, C., 66
Cradock-Watson, J. E., 12, 60
Crane, K. T., 20
Craske, J., 17, 61
Crone, P. B., 10, 40, 53, 58
Crow, K. D., 64
Cumming, H., 62

Cunliffe, A. C., iii
Cunningham, B. D., ix, 7, 40
Curry, A., 12
Curtis, M. A., 8, 60, 66, 72
Cust, G., 8
Cvjetanović, B., 70

Dadswell, J. V., 17, 61
Darnell, R., 20
Davies, D. G., 13, 28, 41
Davies, G., 13
Davies, H., 62
Davies, Joan R., 14, 25, 30, 41, 42, 62, 65
Davies, P. D., 61
Dawkins, H. C., 17
de Sa, J. D. H., 8
de Saxe, Maureen, 8
de Silva, L. M., 16, 61, 72
Dhar, S. K., 61
Diamond, J. R., 68
Dighero, Mabel W., 9, 72
Dixon, J. M. S., 27
Dolby, A. E., 72
Donovan, T. J., 16, 40
Dowdle, W. R., 69, 70
Drasar, B. S., 10
Duddridge, L. R., 10
Dugdale, J. B., 61
Dulake, C., 15, 42, 67
Dumonde, D. C., 70, 73
Dunbar, J. M., 41
Duncan, G. D., iii
Dunn, G. F. N., 61
Dunnett, W. N., 39
Dymock, I. W., 61

Easton, J. A., 63
Eaton, B. R., 19
Ebling, F. J. G., 63
Edel, W., 74
Edgar, W. M., 21
Edward, D. G.ff., 61, 73
Edwards, Joan M. B., 9, 62
Efstratiou, A., 66
Elek, S. D., 62
Elkan, E., 62
Elias-Jones, T. F., 25
Elliott, K., 61, 62, 69, 71
Ellis, C., 19
Ellis, E. M., 64
Emberley, N. W., 58
Ernφ, H., 62
Essex-Cater, A. J., iii
Evans, Andrea, 8
Evans, A. D., 11, 30, 31, 42, 65, 75
Evans, D. B., 68
Evans, D. G., iii
Everall, P. H., 18, 68

Fagg, C. G., 73
Fallon, R. J., 66
Farrant, W. N., 15
Farrell, I. D., 62, 69
Fell, H. W. K., 62
Fennell, H., 62
Ferguson, I. R., 15
Field, Anne M., 9, 61, 62
Finch, R. G., 66
Finnie, Evelyn M., 13, 58, 75
Fisher, P. J., 9
Fitt, Margaret, 16
Fitzpatrick, S., 64
Fleck, D. G., 15, 32, 61, 62, 68
Fletcher, B. N., 63
Fletcher, E. W., 59
Fletcher, S. M., 62
Fletcher, W. B., 8, 39, 40, 70
Flewett, T. H., 21, 42, 61, 62
Flynn, F. J., 8
Foord, N., 8, 62
Foreman, J., 9
Forfar, J. O., 71
Fox, E., 15, 67
Fraser, C. A. M., 67
Fraser, P. K., 15, 40, 62, 63
Freeman, R., 62
Freundt, E. A., 61, 62
Frost, Jennifer, 8
Furniss, A. L., 16, 26

Galbraith, I., 67
Gall, D., 72
Gamble, D. R., 14, 26, 61, 62, 68, 77
Gardner, Sylvia D., 9, 27, 30, 61, 62, 75
Geddes, A. M., 68
Ghosh, A. C., 9, 64
Gibson, G. L., 11, 25, 32, 33, 39, 62
Gibson, J. R., vi
Gibson, Patricia E., 9
Gilbert, Gwendoline L., 16
Gilbert, R. J., 9, 31, 42, 63, 64, 69
Gill, J. B., 62, 63
Gillespie, E. H., 12, 63
Gilmour, O. J. A., 63
Gleeson-White, M. H., 21
Glencross, E. J. G., 17
Gonzalez-Lavin, L., 66
Gostling, J. V. T., 17, 40, 42, 64, 73
Gotschlich, E. C., 70
Gourlay, R. N., 59
Graham, J. M., 18
Grant, G. H., 68
Graves, Bessie H. E. Cadness, 58
Gray, J., 12
Gray, R. D., 16, 40, 41, 63
Greasby, A. S., 18
Greatorex, F. B., 19
Greaves, P. A., 16
Green, Helen T., 12
Green, P. J., 68
Greenbury, C. L., 40, 53
Greves, P. W., 63
Grieve, N. W. T., 67
Griffith, A. H., 72
Griffiths, P. W. W., 58
Grindley, June N., 63, 70
Grindley, N. D. F., 63, 70
Grob, P. R., 67
Gross, R. J., 9, 63, 64, 65
Guiney, Margaret M., 9

Haines, C. R., 70
Hale, J. H., 12, 31, 34, 42, 63, 72
Hall, J. A., 12
Hall, Mary L. M., 9, 63
Halliday, D. F., 15
Hambling, M. H., 11, 27, 31, 42, 62, 63, 71, 72
Hampil, B., 74
Harding, W. G., iii
Hardy, Margaret M., 8

Harman, R. R., 63
Harper, I. A., 19, 71
Harper, R., 12
Harris, D., 63
Harrison, S., 59
Hart, J. C. D., 60, 61, 63
Hart, R. J. C., 14, 39, 40, 42, 63
Harvey, R. W. S., 11, 42, 63, 75
Haughton, L. T., 18, 41
Hayek, L. J. H. E., 21
Healing, D., 60
Heaton, Sandra P., 10
Hedges, A. J., 70
Heimer, G. V., 15, 40, 71
Hellawell, Judith M., 12
Henderson, B. E., 60
Henderson, R. J., 19, 29, 40, 42, 63, 64
Henderson, Susan, 11
Henry-Aymard, M., 70
Herbertson, B. M., 68
Hers, J. F. P., 62, 66, 69, 72
Hewish, R. A., 9, 59
Hewitt, J. H., 17
Hewitt, M., 64
Heymann, C. S., 21
Higgins, P. G., 9, 40, 64
Hill, I., 64
Hill, J., 73
Hill, L. R., 9, 60, 64, 66, 70, 71
Hill, M. J., 10
Hilton, A. L., 69
Hinchliffe, P. M., 69
Hobbs, Betty C., 9, 26, 42, 59, 60, 63, 64, 66, 69, 70, 73
Holley, A., 69
Hollingdale, M. R., 10, 64
Holmes, B., 8, 66
Hone, Rosemary, 64
Hooper, W. L., 17, 42, 73
Hope-Simpson, R. E., 57, 58, 64
Hopkins, G. B., 64
Hoskins, T. W., 65
Howard, C. J., 59
Howells, C. H. L., 11, 32, 39, 40, 65, 75
Howie, Sir James, vi, vii, 65
Hoyle, L., 59, 65
Huddy, R. B., 65
Hughes, M. H., 19, 39, 40, 65
Human, R. P., 68
Humphreys, G. O., 8, 63, 70
Hunt, A. C., 68
Hutchinson, D. N., 17
Hutchinson, Gillian, 9
Hutchison, J. G. P., 11, 60, 66

Illis, L. S., 73
Ingham, H. R., 12
Ironside, A. G., 70
Ispahani, Purvin, 16
Ivey, Barbara R., 18
Ivory-Hollingsworth, W. R., 11

Jackson, F. B., 13
Jackson, R. V., ix, 7
Jacobs, A., 72
James, Ruth C. J., 16
James, S. M., 63
James, W. E. B., 66
Jameson, J. E., 58
Jeanes, A. L., 25
Jenkins, H. R., 19
Jenkins, P. A., 10, 65, 70
Jephcott, A. E., 12, 60, 65, 72
Jevons, M. Patricia, 21
John, R. W., 65
Johnson, R., 61, 65, 66, 71
Johnston, H. H., 12, 42, 59
Johnston, Nafra A., 10, 65
Jones, D. J., 72
Jones, D. M., 12, 42, 61, 65, 67, 70
Jones, M., 66
Jones, M. S., 17
Jones, P. H., 16
Jones, R. V., 59
Joynson, D. H. M., 10, 72
Jurmanová, K., 62

Kampelmacher, E. H., 74
Kampfner, G., 60, 61
Karim, K. A., 11, 65
Keane, C., 64
Kelley, W. R., 39
Kelsey, J. C., ix, 7, 8, 39, 40, 42, 65
Kendall, Margaret, 9, 64
Kennedy, D. H., 66
Khan, M. S., 60, 61
King, B., 62
Kirkwood, Betty R., 8
Knappett, C. R., 21
Knight, J., 61, 62, 69, 71
Knight, P., 72
Knowles, Wendy A., 9
Kolator, Barbara D., 10
Kulkani, Vaishali A., 9
Kunze, M., 62
Kurtz, J. B., 14
Kwantes, W., 18, 27, 32, 66

Lane, W. F., 58
Landsdowne, D. T., 14
Langford, E. V., 66
Langsdale, G. A., 73
Lapage, S. P., 8, 9, 39, 40, 60, 66, 70, 71, 72
Larkin, A. I., 66
Laurence, B. R., 27
Lavender, G. W., 10
Lawrie, G. M., 67
Lawy, H. S., 21
Leach, R. H., 9, 59, 62, 66, 71
Leat, J. L., 10
Lechevalier, H. A., 66
Lee, H. Y., 65
Lee, J. A., 66
Lee, J. V., 16
Leek, J., 19
Legros, Rita M., 9
Lemcke, R. M., 59, 73
Le Minor, L., 66
Lessel, E. F., 66
Lewis, D., 63
Lewis, M. J., 16
Lidwell, O. M., 8, 30, 42, 66
Little, L. A., 11, 58
Littlejohns, P. D., 11
Lloydbottom, H. L., 7
Lockey, Eunice, 66
Longson, M., 22
Love, Wendy, 66
Lovelock, D. W., 64
Lowe, G. H., 16

Lowbury, E. J. L., 65
Lowes, E., 39
Ludlam, G. B., 11, 32, 65, 67
Lumsden, W. H. R., 30
Lyne, P. M., 61

Macara, Agnes J., 9, 29
Macaulay, Margaret E., 12
MacCallum, F. O., 42, 72
McCarthy, K., iii, 31
McConnell, Moyra, 8
McCoy, J. H., 14, 39, 40, 41, 42
MacDonald, H., 70
McDonald, Helen, 12
McDonald, J. R., 9, 40, 41
McEntegart, M. G., 27
McGechie, D. B., 12
McGhie, D., 11, 66
McGimpsey, G., 10
McKay-Ferguson, E., 8
Mackenzie, A. M. R., 18
Mackenzie, D. W. R., 10, 28, 41, 67
McLachlan, M. S. F., 59
McNab, D. J. N., 64
Macrae, A. D., 16
McSween, R., 61, 67
McSwiggan, D. A., 15, 42
Mahgoub, E. S., 73
Maini, R. N., 70, 73
Mair, Hélène J., 15, 39, 67
Mair, N. S., 15, 34, 67, 71
Mallinson, H., 12
Mamattah, H. J. K. M., 67
Mann, P. G., 13, 39, 42, 67
Manners, B. T. B., 67
Marks, J., 10, 33, 65, 67, 70
Marmion, V. J., 60, 63
Marples, R. R., 8
Marshall, D. W., 13
Martin, Diana R., 67
Martin, T. D. M., 22, 63
Maskell, Rosalind M., 17, 60, 67, 68
Masters, R. C., 17
Matsen, J. M., 67
Maurer, Isobel M., 67
Mawer, S. L., 16
Maxted, W. R., 8, 67, 69, 72
Maybury, P., 13
Mayon-White, R. T., 12
Mazhar, M. M., 67
Meadow, P. M., 60
Meenan, P. N., 39
Meers, P. D., 17, 67, 68, 69
Meller, S., 59
Melnick, J. L., 74
Meurisse, E. Valerie, 14
Meyrick, E. A., 68
Miles, R., 62
Millard, P. R., 68
Miller, Christine L., 8, 65
Miller, D. C., 64
Miller, D. L., 39, 63, 64, 68, 74
Mills, J. C. K., 19
Mitchell, E. R., 16, 39, 41, 68
Mitchell, N. J., 18, 42, 58, 68
Moore, B., iv, 14, 28, 39, 41, 42
Moore, J. M., 22
Moore, W. B., 61
Morgan, H. D. S., 13, 28, 41
Morgan, T. A., 69
Morris, C. A., 18, 39, 41, 60, 63, 68
Morris-Owen, R. M., 72
Mortimer, P. P., 9
Mortimer, P. R., 16
Morton, R. S., 60
Mullan, D. P., 64
Munro, Julia A., 11
Murray, H. G. S., 15
Murray, I. G., 73
Myres, A. T. M., 68

Nagington, J., 11, 42, 62, 63, 68
Nakhla, L. S., 68
Naylor, G. R. E., 11, 41, 62
Neary, M. P., 68
Nelson, G. S., 28, 33
Newell, L., 71
Newsom, S. W. B., 22
Nicholls, A., 73
Nicholls, M. W. B., 22
Noah, N. D., 8, 39, 68
Noble, R., 60
Noone, P., 68
Norris, J. R., 69
Norton, R., 58

Oakes, Mary, 68
O'Grady, F. W., 22
Okubadejo, O. A., 17, 68, 69
Olds, R. J., 62
Oliver, W. T., 71
Olurin, O., 68
Ørskov, F., 68
Ørskov, Ida, 68
Osuntokun, B., 68
Owen, R. J., 9, 66, 68

Page, Catherine, 9
Parker, M. T., iv, 7, 8, 29, 31, 32, 39, 42, 68, 69, 70
Parrack, Stella M., 12
Patton, J. B., 18
Paull, A., 69
Paver, W. K., 11, 69
Payne, D. J. H., 17, 26, 39, 41, 68, 69, 77
Payne, R. A., 66
Payne, Sheila, 14
Peach, Susan L., 10
Peacock, A., 12
Pead, L., 60
Pead, P. J., 69
Pearson, A. D., 17, 69
Peffers, A. S. R., 69
Pennington, J. H., 13
Pereira, Marguerite S., 9, 29, 31, 39, 40, 41, 60, 68, 69, 70
Pether, J. V. S., 19, 41
Phillips, K. D., 16
Philpot, Christine M., 10, 41, 62
Pilet, J., 60
Pilfold, J. N., 15
Pilsworth, R., 13, 42
Pinegar, J. A., 11
Pinney, Alison M., 69
Pioli, E., 72
Pitt, T. L., 60
Polak, A., 60, 67
Polakoff, Sheila, 8, 42
Pollard, R. W., 69, 71
Pollock, T. M., 8, 39, 60, 65, 69, 70

Poole, Pauline M., 13, 69
Porter, D. A., 18
Porter, K. A., 61
Porterfield, J. S., 25
Porterhouse, Audrey, 8
Powell, D. G., 59
Preston, N. W., 22
Price, D. G., 61
Price, Elizabeth, 15
Price, T. H., 11, 63
Proctor, A. G. J., 10
Pullinger, Marian M., 8
Pykett, Angela H., 12, 69

Quaife, R., 17

Rahi, A. H. S., 61
Rahman, A. F. M. S., 69
Redway, K. F., 66
Reeves, D. S., 22
Reid, D., 68
Reid, D. D., iii
Reid, J. J. A., iii
Renton, P. H., 61
Ribbons, D. W., 69
Rich, G. E., 12, 72
Richens, E. R., 67
Richmond, M. H., iii, 65
Richmond, Shirley J., 11, 69
Ridehalgh, M. K. S., 61
Ridley, D. S., 29
Roberts, C., 12
Roberts, Diane, 9, 64
Roberts, T. A., 69
Robertson, L., 17, 42, 62, 69
Robertson, M. J., 11
Rodgers, F. G., 9, 70
Rodin, P., 70
Roebuck, Mary O., 9
Rohde, R., 66
Rolfe, V. C. T., 11
Rondle, C. J. M., 62
Rook, A., 63
Roome, A. C. P. H., 14
Ross, Helen G., 16, 58
Rotter, M., 70
Rowe, B., 9, 26, 27, 42, 63, 64, 66, 68, 70
Rubenstein, D., 68
Russell, A. S., 70
Ryan, W. J., 14, 70
Rycroft, J. A., 13, 41

Saaed, A. A. G., 15
Sanborn, W. R., 70
Sandys, G. H., 17
Savoy, L. G., 59
Scarfe, Susan T., 69
Schaefer, W. B., 70
Schild, G. C., 69, 70
Schimmel, D., 71
Scotland, Sylvia M., 9
Scott, A. C., 40, 53
Scott, R. J. D., 64
Scrimgeour, G., 18, 58, 70
Scruton, M. W., 13, 75
Scutt, R. W. B., 64
Seal, D. V., 15
Seeliger, H. P. R., 66
Selkon, J. B., 12, 33, 70, 72
Sellers, J., 12
Sequeira, P. J. L., 34
Seth, A. D., 10, 70
Severn, M., 22
Shafi, M. S., 68
Shannon, R., 11, 70
Sharp, D. S., 70
Sharp, J. C. M., 70
Sharpe, M. Elisabeth, 70
Sharpe, W., 70
Shaw, D. B., 63
Shaw, R. M., iii
Shepherd, W., 16
Shipp, Christine R., 9
Shooter, R. A., iii
Simmons, L. E., 12
Sippel, J. E., 70
Sivell, C. W., 16
Skan, D. A., 58
Skinner, F. A., 60, 74
Skirrow, M. B., 19
Sleight, G., 59
Smith, A. J., 14
Smith, A. J. Kingsley, 13, 41, 42
Smith, C. E. Gordon, iii
Smith, H. G. M., 58
Smith, H. R., 8, 63, 70
Smith, Jane K., 9
Smith, J. W. G., 8, 39, 40, 63, 71, 72
Smith, M. S., 68
Sneath, P. H. A., 65, 66, 71
Snell, J. J. S., 68, 71, 73
Spain, G. E., 14
Spence, G., 14
Stancliffe, Dawn, 12
Stark, J. M., 22
Starzl, T. E., 61
Stern, H., 26
Stevens, C. C., iv
Stevens, M., 71
Stevenson, J., 71
Stipkovtis, L., 71
Stokes, Joan E., 22, 40, 53, 60
Storari, F. E., 60
Strangeways, Janet E. M., 15
Stratton, F., 61
Stringer, M. F., 8
Suckling, W. G., 18
Supran, E. Margaret, 9, 40
Sussman, M., 22, 28, 41, 59
Sutcliffe, W. A., 12, 40
Sutton, R. N. P., 23
Swan, H., 63
Swarz, H., 60
Sykes, G., 60, 74

Talbot, J. M., 23
Tanner, Elizabeth I., 14
Tapp, E., 61
Taylor, C. E. D., 15, 29, 40, 71
Taylor, G. W., 14
Taylor, Hilda, 19
Taylor, K. W., 61, 62
Taylor, J. A., 9
Taylor, Vivienne M., 7
Tebbutt, G., 11
Tee, G. H., 14, 71
Thom, B. T., 13, 58
Thomas, A. I., 69
Thomas, C. G. A., 16
Thomas, K. L., 13, 60

Thomas, M. A., 67
Thomas, Mair E. M., 8, 40, 42, 66, 71
Thomas, W. R. G., 23
Thompson, R. G., 19, 71
Thomson, Scott, 23
Threlfall, E. J., 8, 59, 71
Tillett, Hilary E., 8, 39, 71
Tobin, Barbara M., 12, 65
Tobin, J. O'H., 12, 39, 40, 61, 65, 69, 71, 72
Tomlinson, A. H., 12, 71, 72
Toomey, R., ix, 7
Towers, Adeline G., 8, 72
Townshend, R. H., 72
Tran, T. P. L., 60
Trevains, Phillippa H., 19
Turk, D. C., 23, 72
Turk, F., 64
Turk, S., 64
Turnbull, P. C., 9
Turner, G. C., 12, 25, 33, 42, 72
Turner, L. H., 10, 72

Urquhart, G. E. D., 72

Vandervelde, Elise M., 9, 61
Varga, L., 71
Vernon, Enid D., 8, 39
Vesselinova-Jenkins, C., 65
Vignon, M., 73

Wales, J. K., 72
Walker, D. J. C., 62
Walker, D. M., 72
Walker, G. H., 66, 72
Wallace, Betty E., 23
Wallace, J. G., 15, 40
Waltho, A., ix, 7, 41, 42
Wannamaker, L. W., 67
Ward, Linda R., 8
Warin, J. F., iv
Watkinson, G., 67
Watkinson, Joan M., 12, 41, 42
Watson, C. E., 14
Watson, G. I., iv
Watt, P. J., 23
Weir, D. M., 28, 41
Westlake, R. H., ix, 7, 39
Whale, Kathleen, 12
Whelan, J. P. F., 72
Wherry, Patricia J., 8
Whitby, J. L., 53
White, Elizabeth McC., 14
White, G. B. B., 12, 40
White, W. G., 72
Whitehead, J. E. M., 13, 72
Whittaker, J. D., iv, ix, 7, 40
Whittaker, J. S., 61
Whyte, Betty H., 7, 41
Widdowson, Jean, P., 8, 67, 69, 72
Wieneke, Antonnette A., 9, 63, 64
Wigfield, A. S., 72
Wildy, P., 31
Wilkinson, A. E., 10, 34, 72
Wilkinson, D. S., 63
Willcox, W. R., 8, 60, 66, 72
Williams, K., 60, 73
Williams, J. D., 68
Williams, R. E. O., vii, ix, 7, 10, 57, 75, 77
Williams, R. Fraser, 23
Williams, W. J., 72
Willis, A. T., 16, 25, 40, 60, 72, 73
Willshaw, Geraldine, 8
Wilson, Margaret A. M., 12, 42
Windsor, B. P. G., 73
Windsor, G. D., 73
Winkler, K. C., 62, 66, 69, 72
Wolinsky, E., 70
Wood, A. R., 13
Wood, N. A., 70
Wooburn, J. C., 60
Woodroof, D. P., 9
Woolf, I. L., 61
Wormald, P. J., 18, 40, 61
Wright, A. E., 14, 41
Wright, E. A., 64

Yates, M. D., 10
Yekta, M. H., 72
Young, Susan E. J., 20

Zamiri, I., 23
Zealley, Monica, 13

Printed by The Campfield Press, St. Albans